MTA New York City Transit

ENVIRONMENTAL DUE DILIGENCE ASSESSMENT (EDDA)

For the

PROPOSED SUBSTATION: WEST 28TH STREET/8TH AVENUE LINE

Project Location:

New York, New York

August 2022

Prepared for:

MTA Construction and Development

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Introduction

The Metropolitan Transportation Authority Construction and Development ("MTA C&D," formerly referred to as "MTA New York City Transit" or "MTA NYCT") proposes to construct and operate a new below grade substation to serve the segment of the IND Division's A/C/E service between West 13th Street and West 53rd Street in Manhattan, New York ("Proposed Project"). This segment of the subway is underpowered, and so a new substation along 8th Avenue is necessary to increase service under future Communications Based Train Control ("CBTC") and to support contingency service. The proposed substation would provide power capacity to increase train service from an average of 13 trains per hour ("tph") to up to 36 tph.

The MTA C&D Design Team considered locations west and east of 8th Avenue between West 26th Street and West 42nd Street that were located within 300 feet of the existing subway power system (i.e., the maximum effective distance between a transformer and the system). The Project Site presented herein (within the right-of-way of West 28th Street between 8th Avenue and 9th Avenue) was advanced, as it would allow for substation access, accommodate the substation design, and minimize potential adverse effects. Specifically, compared to other potential sites considered, the Proposed Project would minimize the magnitude of impacts to the community, including potential construction-period impacts to nearby buildings, and it would minimize the need to relocate utilities.

Purpose and Need

The Metropolitan Transportation Authority New York City Transit conducted a study in December 2013 entitled "Traction Power System Study for the Queens, 6th Avenue and 8th Avenue Subway Lines" ("the study") to evaluate the capacity of the traction power system to support future CBTC and "contingency service." "Contingency service" refers to the provision of power to support routine operations when the power system is disrupted (e.g., a substation is out of service) or when more trains are running on a certain track segment than planned. The study determined that a new substation is needed along 8th Avenue, between West 26th Street and West 42nd Street, in order to implement CBTC operation and support contingency service.

The purpose of the Proposed Project is to construct a new substation that would provide increased power to the IND Division's A/C/E subway service between West 13th Street and West 53rd Street and allow for operation of the subway under a future CBTC system, as well as under contingency service. The new substation will provide power to all tracks on the A, C, and E services on the 8th Avenue Line, at a capacity to increase tph from an average of 13 tph to up to 36 tph.

Project Site

The Project Site is located on West 28th Street between Tax Blocks 752 to the north and 751 to the south, in the Chelsea neighborhood of Manhattan Community District 4 (see **Figure 1.1, "Project Location"** and

Figure 1.2, "Tax Map"). West 28th street is an eastbound residential street that curves to the north approximately 125 feet east of the 9th Avenue intersection, and then curves to the south at approximately the same distance from the 8th Avenue intersection.

The Project Site is located within the New York City Department of Transportation ("NYCDOT") roadbed along West 28th Street and the adjacent sidewalk. The existing right-of-way in this location is approximately 70 feet wide, encompassing two 10-foot sidewalks, two 12-foot travel lanes, and two 13-foot parking lanes. **Figure 1.3a, "Aerial,"** provides an aerial view of the Project Site and study area.

Existing land uses around the Project Site include the Penn South apartment buildings (also known as the Mutual Redevelopment Houses, Inc.) to the north and south, the Church of the Holy Apostles Episcopal Church at the intersection of West 28th Street and 9th Avenue, as well as mixed residential, commercial, and educational facilities.

Proposed Project

The MTA C&D is proposing to construct and operate a new below grade substation at the Project Site. Implementation of the Proposed Project would involve installation of cables connecting the substation to the 8th Avenue line track power system, installation of substation access hatches, and sidewalk widening.

Construction of the proposed substation would require the relocation of utilities, excavation to build the below ground structures, installation of equipment, and restoration of the Project Site. Prior to the start of construction, the contractor would develop strategies for construction staging. Construction staging comprises the planning and management of equipment storage, site access, temporary truck parking, and equipment placement during construction. For the purposes of this analysis, construction staging is assumed to be limited to within the Project Site, while fabrication and storage of construction elements would occur at an off-site property (i.e., contractor's yard or construction workshop) outside of the study area.

The area under construction would be closed off by construction fencing. Construction work would be typically conducted between the hours of 7 AM and 3:30 PM due to noise ordinance restrictions. A Maintenance and Protection of Traffic ("MPT") plan would be developed by the contractor and approved by NYCDOT prior to street lane closures. The MPT plan would stipulate the date and duration of the lanes closure and would include traffic diversion routes and provisions for emergency vehicles.

The first stage of construction includes the installation of piles, potentially including secant piles, soldier piles with lagging, or sheet piles to construct the support of excavation ("SOE") structure. The Project Site would then be excavated, followed by the installation of the steel and structure foundation. The concrete would then be poured to form the floor, walls, and ceiling of the substation. Upon completion of this stage, the largest equipment would be delivered, and the hatch would be closed. The Project Site would then be restored, while underground activities related to the trackwork, cabling, and energizing of the substation occurs.

The Principal Conclusions of Environmental Analysis

Given that the Proposed Project would result in the construction and operation of a new below grade substation within the New York City Department of Transportation ("NYCDOT") right-of-way, its effects would generally be contained to the area beneath the Project Site. As currently contemplated, the design and construction of the Proposed Project would avoid or minimize adverse construction-period effects to the greatest extent feasible and practicable. Further, upon construction completion, the Project Site would be restored to its existing conditions to the extent practicable.

Potential impacts during both the operational (permanent condition) and construction period are summarized following in this section, and detailed in Chapter 4, "With-Action Conditions."

Land Use and Neighborhood Character

The Proposed Project would not result in significant adverse impacts with respect to land use and neighborhood character.

The Project Site is located in Manhattan Community District 4's Chelsea neighborhood, to the north of the Meatpacking District and to the south of the Garment District. In the vicinity of the Project Site, this portion of Chelsea comprises a mix of multi-family residential properties, mixed residential and commercial properties, and public facilities (schools) and other educational facilities, such as the Fashion Institute of Technology ("FIT") (see **Figure 2.1, "Land Use"**). Notable among the multi-family residential properties is Penn South, a housing cooperative development of ten residential buildings, is located between 8th and 9th Avenues and extends north and south between West 23rd Street to West 29th Street.

As shown on **Figure 2.2, "Zoning,"** the Project Site and much of the study area (the area within a 400-foot radius of the Project Site) is zoned Residential (R8), which is defined as a high-density residential district consisting of multi-family residences. Commercially zoned areas (C6-2A) are located in the eastern and northwest portions of the study area. An area zoned C6-3X is located in the northeast portion of the study area and extends into a special district located north of the study area, the Special Hudson Yards District. Areas zoned C6-3X are contextual districts with limited building heights and limited floor area ratios. A small regional commercial center (zoned C4-5) is located southeast of the study area.

In the future with the Proposed Project, no change to land use, zoning, or neighborhood character would occur. Construction activities related to the Proposed Project would occur within the roadbed and adjacent sidewalks of West 28th Street. The proposed substation structure would be located underground within the NYCDOT roadbed and the only visible changes within the NYCDOT right-of-way would be the addition of hatches and grates in the streets and sidewalks, and the widening of the northern sidewalk. There would be no effect to the travel lane width or the number of on-street parking spaces during the operational phase. As such, the Proposed Project would not result in significant adverse impacts with respect to land use and neighborhood character.

Socioeconomic Conditions / Community Disruption

The Proposed Project would not result in significant adverse impacts with respect to socioeconomic conditions of the surrounding neighborhoods.

The Proposed Project would not introduce any new land uses, nor would it facilitate any new development in the surrounding area; therefore, the Proposed Project would not affect the overall socioeconomic conditions of the surrounding neighborhoods. However, the construction of the Proposed Project would have the potential to result in temporary community disruption resulting from temporary changes to vehicular and pedestrian circulation (i.e. one-lane traffic closures, sidewalk width reduction, etc.), as well as an increase in the number of construction vehicles in the immediate vicinity of the study area. However, these disruptions would be temporary in duration, and would not prevent safe access to the surrounding residences and businesses during construction.

Environmental Justice

The Proposed Project would not result in significant adverse impacts with respect to Environmental Justice ("EJ"); however, given its intended purpose of improving safety and reliability of the transit system on which many EJ communities may rely, the Proposed Project may benefit EJ communities, as well as the businesses and institutions that serve them.

The Project Site is not located within a potential environmental justice community. However, the northern portion of the 400-foot study area includes a small portion of one potential environmental justice community, encompassing West 30th Street between 8th and 9th Avenues and extending further north into the Garment District, as shown on **Figure 2.4, "Environmental Justice Areas."**

The Proposed Project does not involve any changes to existing land uses in the surrounding neighborhoods nor would it facilitate any new development. There would be no direct effects on land use, neighborhood character, demographic or socioeconomic characteristics of the neighborhood as a result of the Proposed Project. While there would be temporary community disruptions during construction as a result of temporary changes to vehicular and pedestrian circulation around the Project Site (i.e. one-lane traffic closures, sidewalk width reduction, etc.), these disruptions would be temporary in duration, and would not prevent safe access to the surrounding residences and businesses during construction. The Proposed Project would enhance service on the A/C/E subway service line between West 13th Street and West 53rd Street by providing more frequent and reliable transit service which would benefit environmental justice communities in the surrounding neighborhood.

Community Facilities and Services

The Proposed Project would not result in significant adverse impacts with respect to community facilities and services.

Community facilities include public or publicly funded schools, libraries, childcare centers, health care facilities, and fire and police protection. Two community facilities are located within the 400-foot study

area, a family dentist and the AHP Chelsea Healthcare Center. The Proposed Project would not result in any direct effects on community facilities, since potential effects would be limited to the Project Site, which is located within NYCDOT right-of-way. Further, the Proposed Project would not introduce new residential or commercial populations to the areas, thus resulting in no indirect effects to community facilities. Access to buildings adjacent to the Project Site would be maintained for police, fire and Emergency Medical Services ("EMS").

Open Space and Parkland

The Proposed Project would not result in significant adverse impacts with respect to open space and parklands.

Two publicly-accessible open spaces are located in close proximity to the 400-foot study area, Chelsea Park (1,000 feet west of the Project Site) and Penn South Playground (600 feet south of the Project Site). On the north and south sides of West 28th Street, Penn South has enclosed landscaped green spaces interspersed with paved paths and benches, which are available to residents.

In the future with the Proposed Actions, there would be no direct or indirect effects to either of Chelsea Park or Penn South Playground, nor would access to the Penn South landscaped areas be directly affected. A Tree Protection Plan would be developed and implemented to protect trees or having canopy spread over the located adjacent to the Project Site and tree protection fencing would be installed during construction, if feasible.

Historic and Cultural Resources

The Proposed Project would not result in significant adverse impacts with respect to historic and cultural resources.

The Project Site is located within Penn South, a site that was determined eligible for listing on the State/National Register of Historic Places ("S/NR") in 2015. Additionally, each building within the Penn South development has been determined individually S/NR-eligible. As shown on **Figure 2.7, "Historic and Cultural Resources,"** a total of eight other historic resources are located within 400 feet of the Area of Potential Effect ("APE") (see **Table 2.4, "S/NR Listed and LPC Designated Structures and Districts in the Study Area"**). Substation construction would not impact the identified historic resources because the proposed substation would not introduce new elements that would detract from their current historical contexts. The substation would be entirely below grade, with only minor changes to West 28th Street and few outward signs of its presence; sidewalk widening and the installation of access hatches and grates flush with the sidewalk surface. The sidewalk widening would not impact the cohesiveness or the context of the Penn South development or Penn South Building 7 since there are already wide public sidewalks primarily without trees or landscaping along both sides of West 28th Street. Sidewalk widening would not detract from any of the architectural and contextual features that define Penn South.

The New York City Building Code provides some measures of protection for all NYC Landmark ("NYCL") properties against accidental damage from adjacent construction by requiring that all buildings, lots, and

service facilities adjacent to foundation and earthwork areas be protected and supported. Additional protective measures apply to designated NYCLs and S/NR-listed historic buildings located within 90 linear feet of a proposed construction site. For these structures, the New York City Department of Buildings' ("DOB") Technical Policy and Procedure Notice ("TPPN") #10/88 apply. TPPN #10/88 supplements the standard building protections afforded by the Building Code by requiring, among other things, a vibration monitoring program to reduce the likelihood of construction damage to adjacent S/NR or NYCL resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed.

The Penn South building 7, which contains the S/NR-listed Bayard Rustin Apartment, is located approximately 50 feet from the construction zone. Vibration control measures would include developing and implementing a vibration-monitoring program during highly disruptive construction activities, such as pile driving, to ensure that historic structures would not be damaged.

The proposed substation has no potential to encounter pre-contact archaeological resources during construction. A review of maps and atlases from the historical period indicates that the APE was once a slope, later intensively developed circa 1854/1857 with row houses, and is now level, hence it has experienced extensive subsurface disturbance. Therefore, there is no potential for an undisturbed pre-contact deposit in the APE and construction would cause no impacts. There is also no sensitivity for historical period archaeological resources in the APE due to lack of deposition and the degree of nineteenth-century disturbance.

Urban Design and Visual Resources

The Proposed Project would not result in significant adverse impacts on urban design and visual resources.

The Proposed Project would not alter the arrangement, appearance, or functionality of the Project Site or the study area. The Project Site would be restored to its existing use as a residential lined street and sidewalk after construction, and the perceptible permanent changes to the Project Site (e.g., widening of the sidewalk for access to the substation) would not alter the visual quality of the surrounding environment, or adversely affect the pedestrian experience. There would be no changes to street patterns, block formation, or building heights as a result of the Proposed Project. During construction the Project Site would detract from the aesthetics of the surrounding streetscape, compared to its current or post-construction condition; however, this effect would be temporary.

A temporary construction easement may be required to conform with any necessary tree protection measures.

Natural Resources

The Proposed Project would not result in any significant adverse impacts on natural resources including floodplains, wetlands, aquatic resources, vegetation, wildlife, soils, groundwater and threatened and endangered species.

The Project Site is located within a developed urban area, and there are no surface waters, aquatic resources, floodplains or wetlands on or adjacent to the Project Site. Habitats for two candidate threatened and endangered species, the Monarch Butterfly (*Danaus plexippus*) and the Yellow Bumble Bee (*Bombus fervidus*), were identified as being located within the vicinity of the Project Site. The status of these species could change from candidate threatened and endangered species, to listed threatened and endangered species during the planning and construction of the project; however, the likelihood of this change cannot be determined at present. The Proposed Project, a below grade substation, would not be expected to change conditions related to either species habitat.

Hazardous Materials

The Proposed Project would not result in significant adverse impacts with respect to Hazardous Materials.

The findings of a Phase I Environmental Site Assessment ("Phase I ESA") identified the potential presence of hazardous materials at the Project Site and in the study area. Recognized environmental conditions ("RECs") include the potential presence of historic fill material at the Project Site. Additionally, portions of the study area were historically developed with facilities that used hazardous chemicals and petroleum products. Undocumented releases from these facilities may have impacted soil and groundwater. (See **Appendix B, "Phase I ESA."**)

Hazardous materials and/or petroleum products in soil and groundwater may be encountered during construction activities associated with the Proposed Project. The health and safety of construction workers and surrounding community would be protected through implementation of a Health and Safety Plan, Soil Management Plan, and Groundwater Management Plan. Once construction is complete and the Proposed Project is operational, pavements would be restored and there would be no potential for contact with hazardous materials in soil or groundwater.

Infrastructure and Utilities

The Proposed Project would not result in significant adverse impacts with respect to infrastructure and utilities.

The Proposed Project would not introduce a new population or development that would the demand for water or sewer services. During construction, the Proposed Project would require relocations of utilities located within the Project Site. Affected utilities include sewer, water, telecommunications, and electricity. Short shutdowns of electric service to Penn South are anticipated during the construction activities. Any shutdown of electric service would be discussed during Public Involvement activities (as discussed in **Chapter 7, "Agency and Public Involvement"**) and appropriate notice would be given prior to the shutdowns. It should be noted that Penn South has private utilities that connect the north and south complex approximately 30 feet east of the Project Site.

Safety and Security

The Proposed Project would not result in significant adverse impacts with respect safety and security.

MTA C&D would comply with all applicable federal and state regulations and has developed processes and procedures to ensure the safety and security of employees, transit riders, and the general public. These processes and procedures are incorporated into the System Safety Program Plan, which governs all MTA C&D facilities during construction and operations. MTA C&D staff and contractors are trained in all appropriate construction safety procedures under this plan. During construction, Safe Work Plans would be developed by the contractors to identify potential hazards and safety measures that would be implemented to protect the health and safety of workers and the general public. During the operational phase of the Proposed Project, the substation would be secured, and access would be restricted to authorized MTA C&D personnel and contractors.

Energy Requirements and Potential for Conservation

The Proposed Project would not result in significant adverse impacts with respect to energy.

MTA C&D improves environmental performance through an Environmental Management System ("EMS") certified in compliance with International Organization for Standardization ("ISO") 14001 requirements. The New York State Executive Order ("E.O.") 111 for "Green and Clean State Buildings and Vehicles" was issued in 2001. MTA C&D complies with E.O. 111, as applicable, by setting goals for energy efficiency, renewable energy, green building design, and alternate fuel vehicles. MTA C&D has developed Design for Environment ("DfE") Guidelines which outline sustainable design features to be considered in new designs and construction projects, including energy efficiency, material conservation, water and site management, indoor environmental quality and operation and maintenance.

No substantial effect to energy or energy supply would occur during construction, and long-term energy demand associated with station operations would not be expected to be notably different from current demand, except, where possible, the MTA C&D would seek to increase energy efficiency. Energy would be consumed during construction; this is unavoidable, and an irretrievable use of resources.

Transportation

The Proposed Project would not result in significant adverse impacts related to transportation and would improve safety and continuity of transit service by increasing the capacity to support CBTC operation.

The Proposed Project would not result in an increase in vehicular volumes or parking demand. No permanent changes to the existing street network are proposed. The limited street network and parking restrictions in place during construction would be temporary and would revert back to existing conditions (public parking, one-way road network) once the proposed substation is constructed. Further, the Proposed Project would improve the safety and continuity of transit service. Without the Proposed Project, the existing subway line would not have the capacity to support the CBTC operation and would remain underpowered.

During some construction phases, eastbound traffic on West 28th Street would be reduced from two travel lanes to one lane. During these phases, traffic volumes would be the same as the No Build Traffic Networks. There would not be an increase in traffic volumes at any intersections in the project study

area; however, there would be a decrease in vehicle capacity on West 28th Street between 8th and 9th Avenues. The work zone traffic control at West 28th Street would result in an increased traffic delay at the intersection of West 28th Street and 8th Avenue; however, all traffic movements would continue to operate at acceptable LOS D conditions or better, resulting in no significant adverse traffic impacts.

Air Quality

The Proposed Project would not result in significant adverse impacts with respect to air quality.

Under the Clean Air Act, the United States Environmental Protection Agency ("USEPA") has established National Ambient Air Quality Standards ("NAAQS") for six criteria pollutants: carbon monoxide ("CO"); nitrogen dioxide ("NO_2"); ozone ("O_3"); particulate matter ("PM"); sulfur dioxide ("SO_2"); and lead ("Pb"). Primary standards are designed to establish limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The New York State Department of Environmental Conservation ("NYSDEC") operates a network of monitoring stations throughout New York City to measure ambient air quality and publishes results on an annual basis. The most recent NYSDEC air-monitoring results identify existing air quality levels for the study area based on data from the monitoring stations nearest the Project Site. The potential for the Proposed Project to result in significant adverse construction period air quality impacts was examined through a detailed analysis. The detailed analysis incorporated emission control measures such as idling restrictions, dust control, clean fuels, etc. Receptors were placed at sensitive land uses and publicly accessible areas surrounding the construction site. With incorporation of the emission control measures, the analysis determined that there would be no exceedance of NAAQS or New York City's *City Environmental Quality Review* ("CEQR") *de minimis* criteria during construction.

Noise and Vibration

The Proposed Project would not result in significant adverse impacts related to operational noise and vibration; however, there is potential for construction period noise and vibration impacts requiring mitigation measures to be implemented.

A detailed noise and vibration assessment was conducted to determine if the Proposed Project would result in any significant adverse impacts with respect to noise and vibration.

Noise

To calculate the incremental impact of construction equipment noise relative to existing background traffic noise, existing noise levels were measured on April 11, 2018 in the immediate vicinity of the Project Site. The monitoring location was selected to represent sensitive receptors in the vicinity of the Proposed Project. Noise levels were measured for 20 minutes during the weekday AM, midday, and PM periods in order to represent the differences in ambient noise, most of which is attributable to traffic.

Three 22-story residential buildings of Penn South are located within 125 feet of the Project Site, and one of those three (Building 9) is located approximately 50 feet east of the Project Site. Public open space is located adjacent to the construction site. Noise levels at these receptors would be elevated over ambient levels during construction activities.

Without mitigation, predicted noise levels for the construction phase would be above the Federal Transit Administration ("FTA") noise guidelines. The worst-case noise levels would occur during the initial site preparation phase. Once site preparation is completed, noise levels would decrease somewhat because fewer pieces of noisy equipment would be required and many construction activities would shift to below ground level. A pre-construction management plan for construction-related noise would be prepared to implement vibration noise control measures and minimize potential noise effects.

Vibration

Alternative methods of construction were analyzed for the installation of the support of excavation structure ("SOE"), including auger drills, impact pile drivers, and vibratory pile drivers. Results indicate that construction activities using impact drivers with a high energy hammer could potentially produce levels of vibration that may be perceptible or disruptive to properties that are located close to the Project Site. The use of impact pile drivers would generate vibration levels above the impact criteria values and exceed damage criteria at the building closest to the construction site, Penn South Building 9. Without the implementation of a vibration monitoring plan (DOB TPPN #10/88), architectural and structural damage to adjacent properties could occur. The use of auger pile and vibratory pile drivers would not generate vibration levels above impact criteria.

A pre-construction management plan for construction-related vibration would be prepared to implement vibration control measures and minimize potential vibration effects. Construction activities could potentially produce high levels of vibration that may be perceptible or disruptive close to the Project Site.

Projected vibration levels for impact pile drivers with high energy hammers would approach or exceed the vibration annoyance level of Penn South Building 9, a property located within 50 feet of the construction zone. These exceedances would be intermittent over the construction period from approximately four to five months and would occur during the daytime hours. This potential effect is expected to be fully avoided through standard pre-construction surveys and construction vibration monitoring during pile installation.

Conclusion

The results of analyses presented in this Environmental Due Diligence Assessment ("EDDA") indicate that the Proposed Project would not result in significant adverse impacts to the environment and would be expected to result in the intended beneficial improvements to the transit service.

Mitigation measures would be implemented to avoid or minimize the potential effects to noise and vibration during construction. None of the potential temporary effects associated with the construction

or operation of the Proposed Project would be of a magnitude or extent that would constitute a significant adverse impact, in accordance with applicable guidance and regulations.

Chapter 1: Introduction

1.1 INTRODUCTION

The Metropolitan Transportation Authority Construction and Development ("MTA C&D") proposes to construct and operate a new below grade substation to serve the segment of the IND Division's A/C/E service between West 13th Street and West 53rd Street in Manhattan, New York ("Proposed Project"). This segment of the subway is underpowered, and so a new substation along 8th Avenue is necessary to increase service under future Communications Based Train Control ("CBTC") and to support contingency service.[1] The proposed substation would provide power capacity to increase train service from an average of 13 trains per hour ("tph") to up to 36 tph.

The MTA C&D Design Team considered locations west of 8th Avenue between West 28th Street and West 42nd Street located within 300 feet of the existing subway power system (i.e., the maximum effective distance between a transformer and the system). The Project Site presented herein (within the right-of-way of West 28th Street between 8th Avenue and 9th Avenue) was advanced, as it would allow for substation access, accommodate the substation design, and minimize potential adverse effects. Specifically, compared to other potential sites considered, the Proposed Project would minimize the magnitude of impacts to the community, including potential construction-period impacts to nearby buildings, and it would minimize need to relocate utilities. This Environmental Due Diligence Assessment ("EDDA") documents the environmental review conducted for the Proposed Project.

As shown on **Figure 1.3b, "Site Plan,"** the Project Site is located immediately adjacent to, and west of the intersection of West 28th Street and 8th Avenue. The Project Site is approximately 500 feet long (east to west) and spans the entire 70-foot New York City Department of Transportation ("NYCDOT") right-of-way. The proposed substation is approximately 40 feet wide (north to south). During construction, a minimum of one 12-foot eastbound travel lane would be maintained on West 28th Street. If a minimum five-foot sidewalk width cannot be maintained within the construction zone, a temporary crosswalk and flagger will be provided to guide pedestrians across West 28th Street. Construction activities would be performed within designated work zones. Parking would be banned in the construction zone. To install cables connecting the substation to the 8th Avenue line track power system, trenches would be excavated in the West 28th Street roadbed from the Project Site to the intersection with 8th Avenue.

As part of the construction activities, the sidewalk on the northern side would be widened by approximately six feet to allow for the installation of hatches to access stairs in the substation. The sidewalk widening would not affect the number of on-street parking spaces or travel lane widths after the sidewalk widening has been completed.

[1] Contingency service is the provision power to support routine operations not otherwise needed, such as when there is a disruption in the power system [e.g., a substation falls out of service (planned or unplanned)]. It also occurs when more trains are on a certain track segment than planned.

1.2 PURPOSE AND NEED

MTA C&D conducted a study in December 2013 entitled "Traction Power System Study for the Queens, 6th Avenue and 8th Avenue Subway Lines" ("the study") to evaluate the capacity of the traction power system to support future CBTC and "contingency service." "Contingency service" refers to the provision of power to support routine operations when the power system is disrupted (e.g., a substation is out of service) or when more trains are running on a certain track segment than planned. The study determined that a new substation is needed along 8th Avenue, between West 26th Street and West 42nd Street, in order to implement CBTC operation and support contingency service.

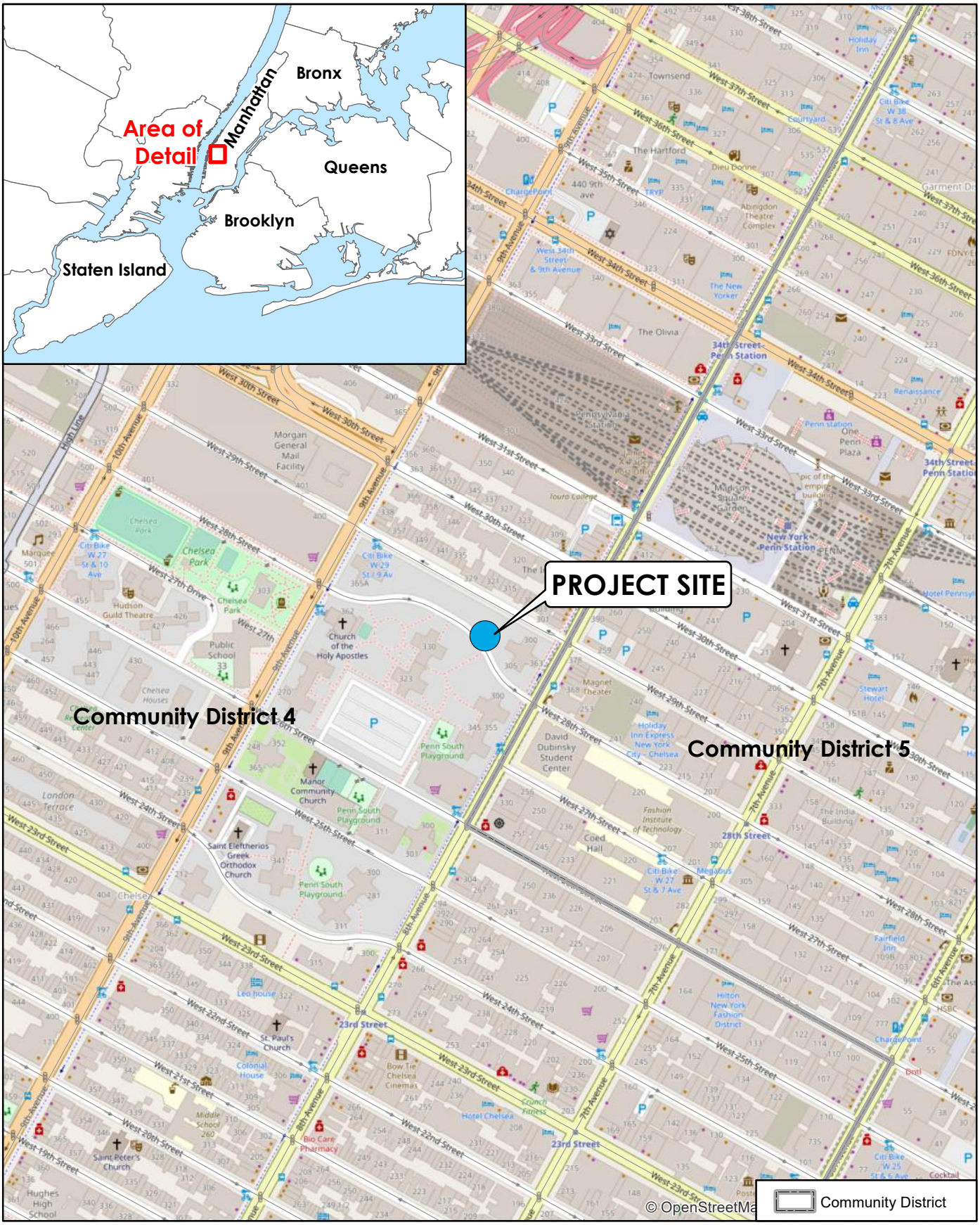
The purpose of the Proposed Project is to construct a new substation that would provide increased power to the IND Division's A/C/E service between West 13th Street and West 53rd Street and allow for operation of the subway under a future CBTC system, as well as under contingency service. The new substation will provide power to all tracks on the A, C, and E services on the 8th Avenue Line, at a capacity to increase train service from an average of 13 tph to up to 36 tph.

1.3 PROJECT SITE

The Project Site is located on West 28th Street between Tax Blocks 752 to the north and 751 to the south, in the Chelsea neighborhood of Manhattan Community District 4 (see **Figure 1.1, "Project Location"** and **Figure 1.2, "Tax Map"**). West 28th Street is an eastbound residential street that curves to the north approximately 125 feet east of the 9th Avenue intersection, and then curves to the south at approximately the same distance from the 8th Avenue intersection.

The Project Site is located within the NYCDOT roadbed along West 28th Street and the adjacent sidewalk. The existing right-of-way in this location is approximately 70 feet wide, encompassing two 10-foot sidewalks, two 12-foot travel lanes, and two 13-foot parking lanes. **Figure 1.3a, "Aerial,"** provides an aerial view of the Project Site and study area.

Existing land uses around the Project Site include the Penn South apartment buildings (also known as the Mutual Redevelopment Houses, Inc.) to the north and south, the Church of the Holy Apostles Episcopal Church at the intersection of West 28th Street and 9th Avenue, as well as mixed residential, commercial, and educational facilities.

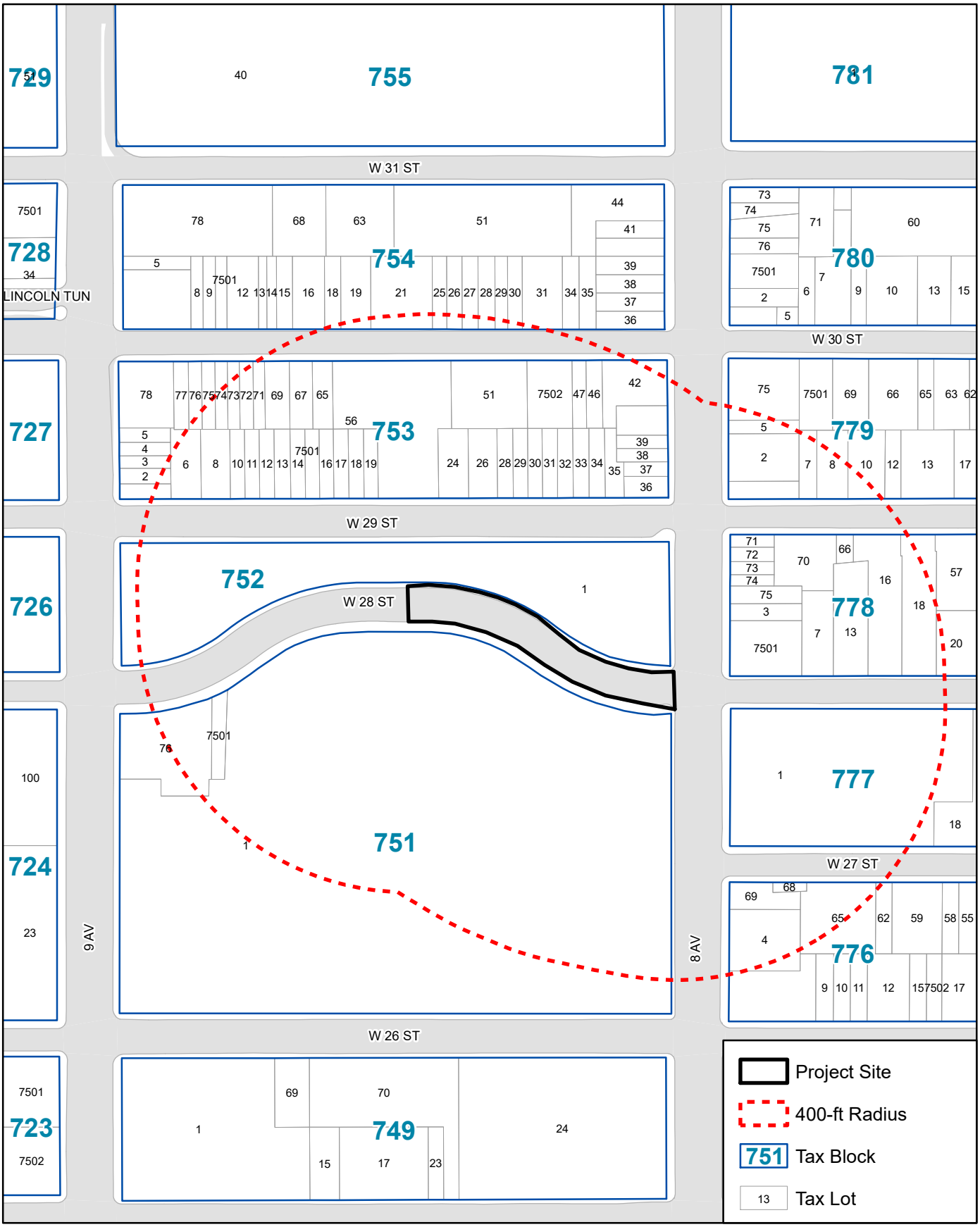


Proposed Substation
West 28th Street & 8th Avenue Line

Figure 1.1

PROJECT LOCATION

MTA Construction and Development



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

N

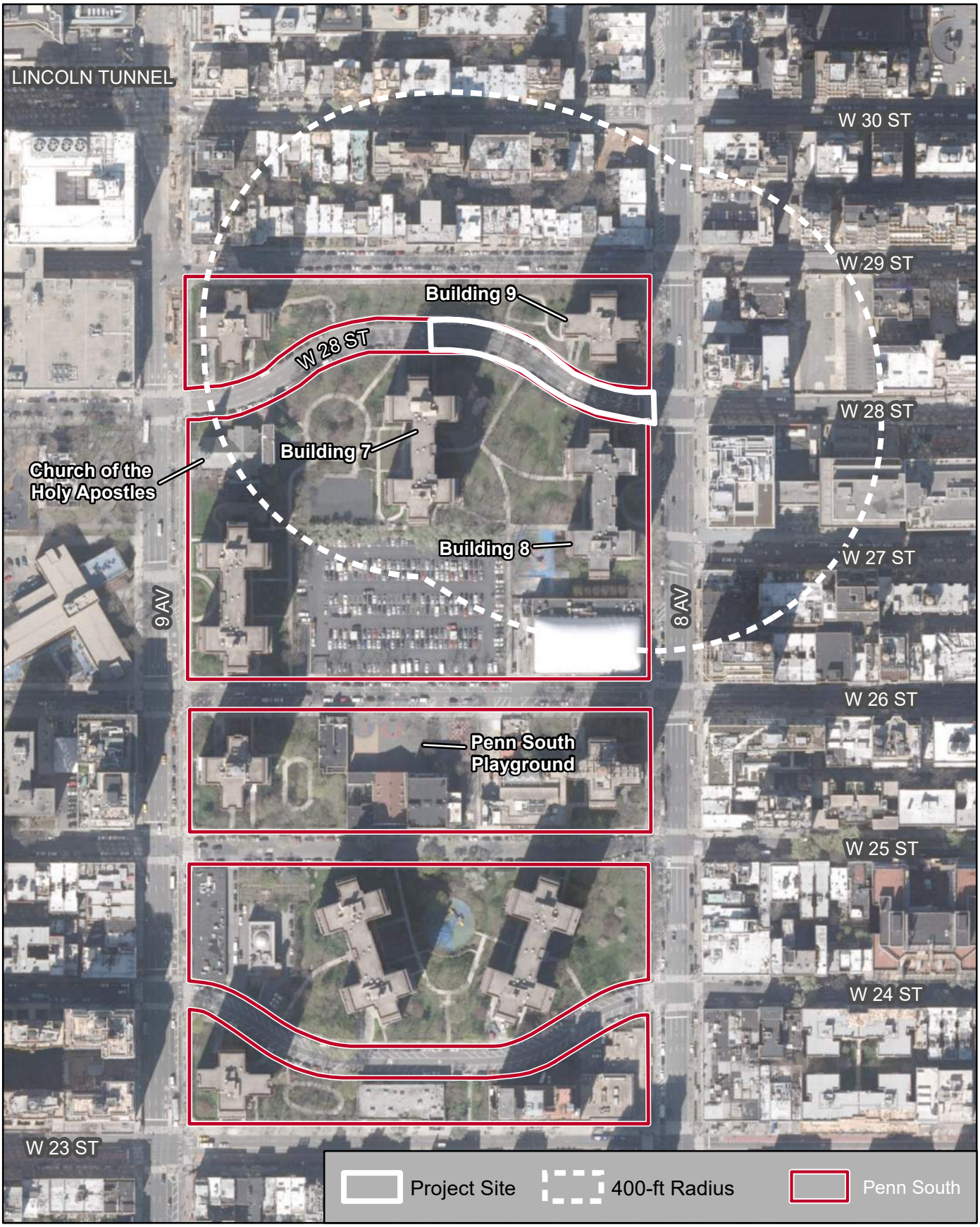
0 100 200 400 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 1.2

TAX MAP

MTA Construction and Development



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

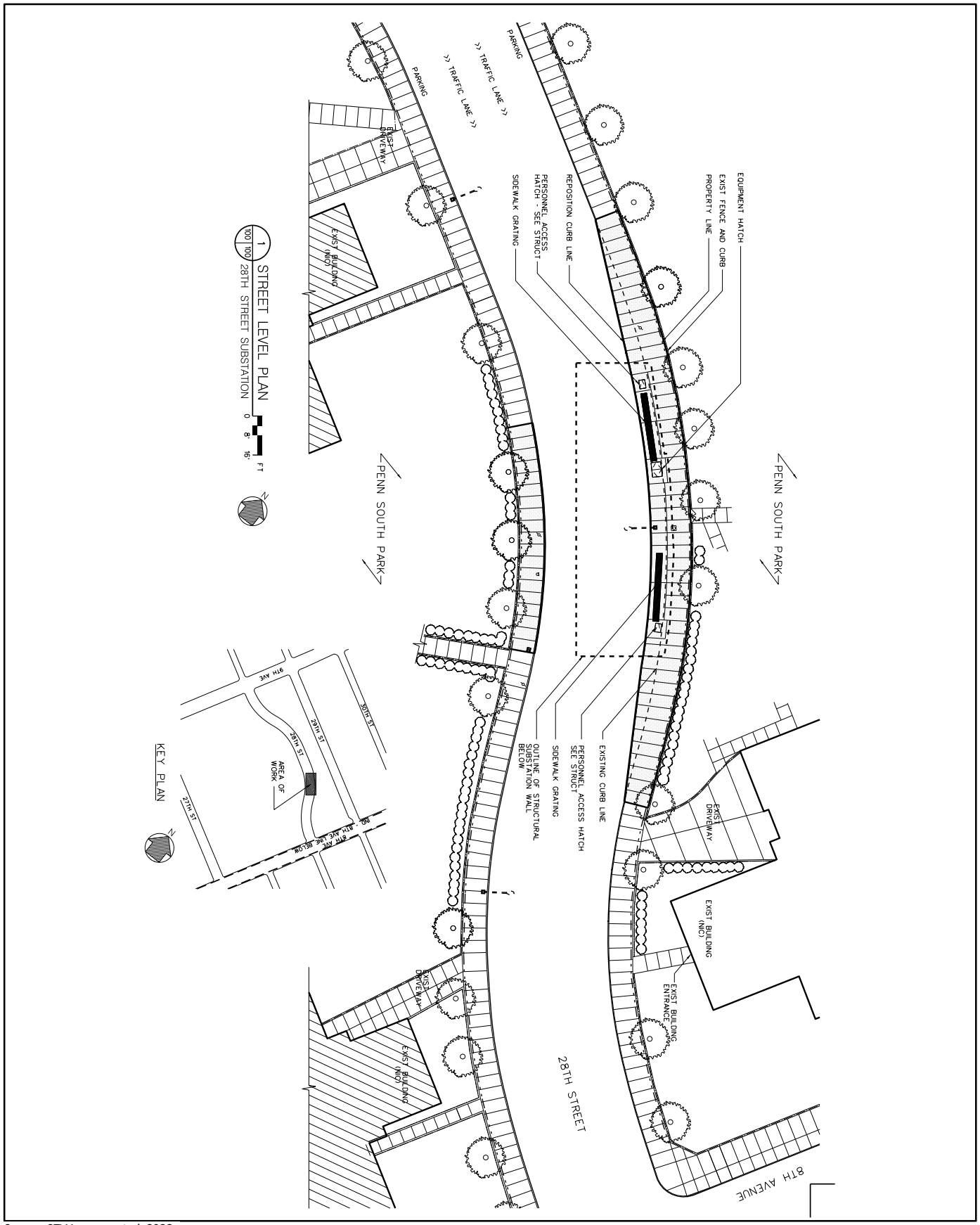
N

0 125 250 500 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 1.3a

AERIAL



Source: STV Incorporated, 2022.

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 1.3b

SITE PLAN

Chapter 2: Existing Conditions

2.1 LAND USE AND NEIGHBORHOOD CHARACTER

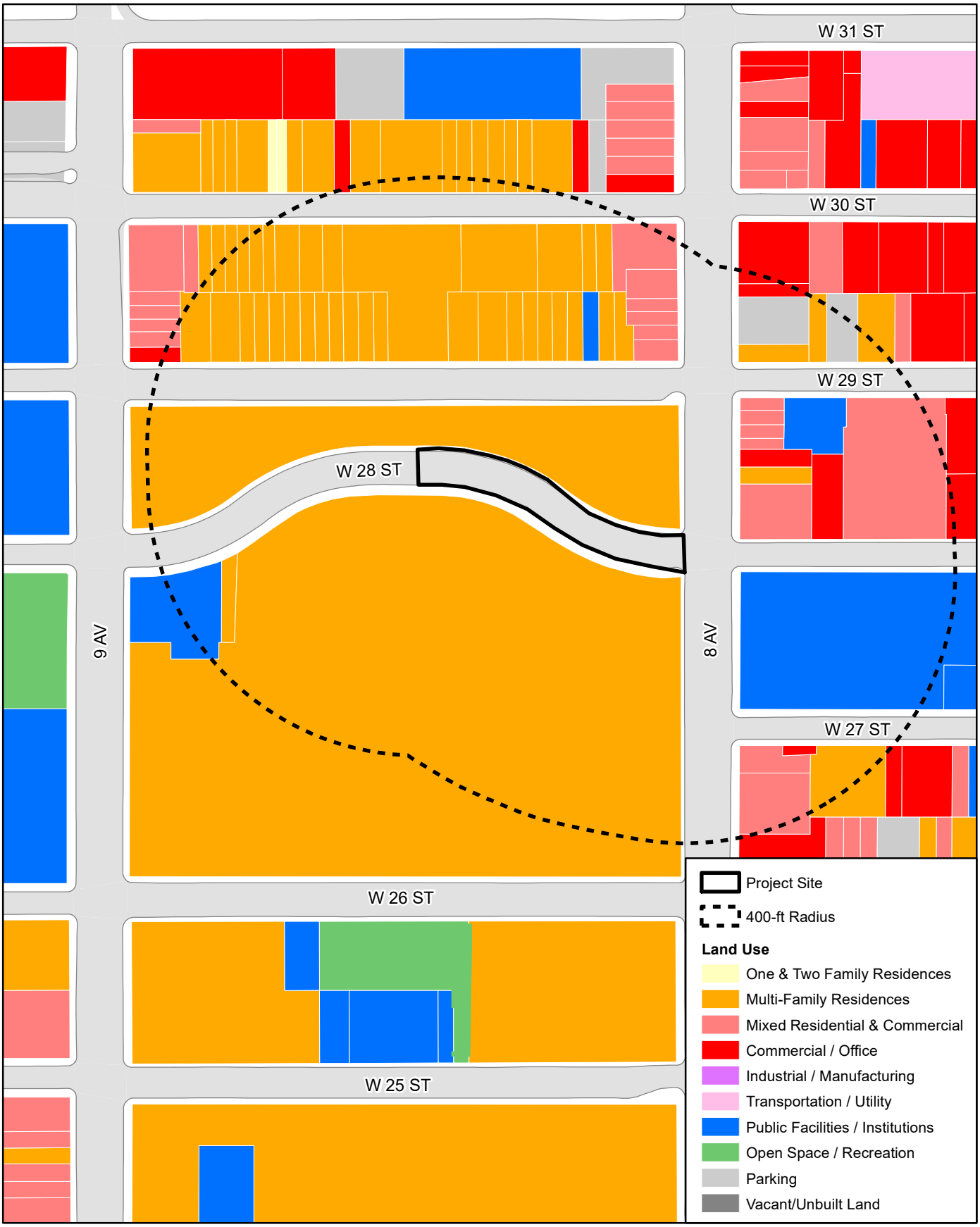
2.1.1 Land Use

The Project Site is located in the Chelsea neighborhood, within Manhattan Community District 4. The Meatpacking District is located to the south and the Garment District is located to the north. As shown on **Figure 2.1, "Land Use,"** the portion of Chelsea located in the vicinity of the Project Site is developed with a mix of multi-family residential properties, mixed residential and commercial properties, and public facilities (schools) and other educational facilities, such as the Fashion Institute of Technology ("FIT").

The Project Site primarily consists of the West 28th Street roadbed and adjacent sidewalk to the north. The Project Site is adjacent to Penn South, a large cooperative residential development, which is located between 8th Avenue and 9th Avenue from West 23rd Street to West 29th Street.

2.1.2 Zoning

As shown on **Figure 2.2, "Zoning,"** the Project Site, and much of the study area (the Project Site and the area within a 400-foot radius) is zoned Residential (R8), a high-density residential district which comprises multi-family residences, including Penn South. Commercially zoned areas (C6-2 and C6-2A) are located in the eastern and northwest portions of the study area. An area zoned C6-3X is located in the northeast portion of the study area and extends into a special district located north of the study area, the Special Hudson Yards District. Areas zoned C6-3X are contextual districts with limited building heights and limited floor area ratios. A small regional commercial center (zoned C4-5) is located southeast of the study area. Areas zoned M1-5 and M1-6D (manufacturing districts that may be partially converted to residential properties or may become residential properties) are located in the vicinity of the Project Site. An M1-6D district is located in the eastern portion of the study area and an M1-5 district is located just outside the 400-foot radius study area to the west of the Project Site.



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

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Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.1

LAND USE

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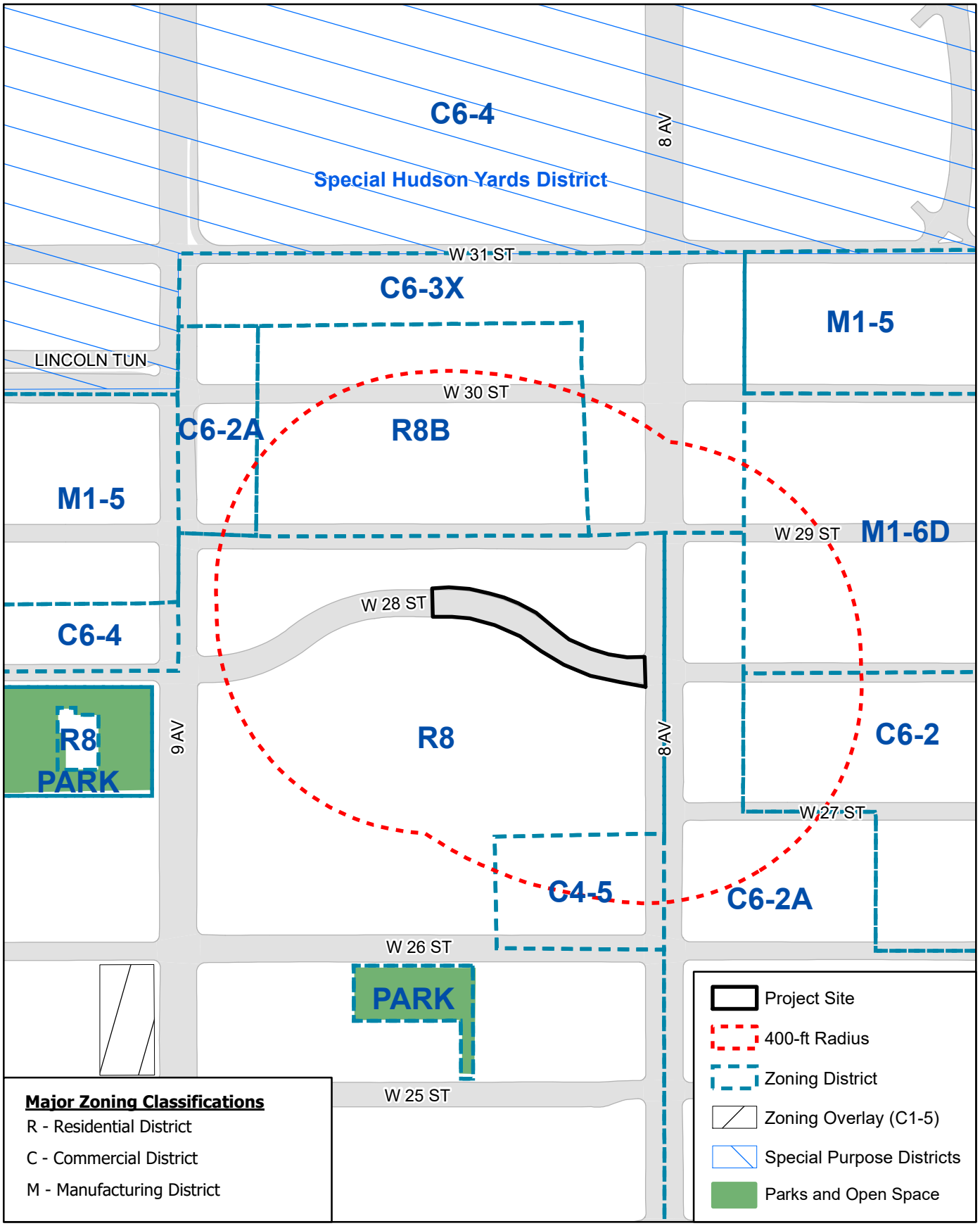

Source: New York City Department of City Planning MapPLUTO 2022; STV Incorporated 2022.

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Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.2

ZONING

2.2 SOCIOECONOMIC CONDITIONS AND COMMUNITY DISRUPTION

The socioeconomic condition of an area is defined in terms of its social characteristics and economic activities. The assessment of social characteristics primarily focuses on the residents and their housing conditions. Economic activities that characterize an area generally include the businesses and institutions operating in the area. As shown on **Figure 2.3, "Socioeconomic Conditions,"** the Project Site is located in Census Tract 97 and the study area (all census tracts within a 400-foot radius around the Project Site) includes Census Tracts 103 and 95. A summary of the socioeconomic conditions within the study area is presented below.

2.2.1 Age Demographics

Table 2.1, "Age Distribution by Census Tract (ACS 2015-2019)," shows the total populations for the tracts within the study area for comparison. The total population within the analyzed tracts is 10,175 persons. These tracts are a mix of residential and commercial land uses, which is reflected in the total population data and shown in land use mapping. The data included are derived from the U.S Census Bureau 2019 American Community Survey ("ACS") data, except as noted.

Table 2.1: Age Distribution by Census Tract (ACS 2015-2019)

Census Tract	Total Population	Age Distribution						Median Age
		Under 5	5-9	10-14	15-19	20-64	65+	
		%	%	%	%	%	%	
Census Tract 97	4,968	2.2	1.2	3.6	1.8	58.7	32.5	55.4
Census Tract 103	2,065	2.2	1.8	1.9	1.3	87.2	5.6	34.7
Census Tract 95	3,142	3.4	2.5	0.6	24.3	58.9	10.2	29.9

Source: American Community Survey, DP05, 2019 5-Year Estimates Data Profiles.

2.2.2 Race and Population Demographics

According to the New York State Department of Environmental Conservation ("NYSDEC"), a "minority community" is a census block group or contiguous area with multiple census block groups having a minority population greater than 51.1 percent of the total population of the area.

As shown in **Table 2.2, "Population, Race, and Ethnicity in Study Area and Surrounding Areas (ACS 2015-2019),"** the population of Census Tract 97, in which the Project Site is located, is 62.0 percent White, 19.3 percent Asian, 6.4 percent Black/African American and 5.8 percent two or more races. **Table 2.2** also depicts the Hispanic/Latino populations within the census tracts. Census Tract 97 has a population of Hispanic/Latino of 23.2 percent, while Census Tract 103 has a Hispanic/Latino population of 5.7 percent and Census Tract 95 has a Hispanic/Latino population of 8.3 percent.

The racial composition of the surrounding community within the study area is racially mixed, and includes white, black or African-Americans, Asians and Hispanics/Latinos. Census data shows that within Census

Tract 103 and Census Tract 95, 35.1 percent and 22.1 percent, respectively, of the community are black or African-Americans, Asians, and Hispanics or Latinos.

Table 2.2: Population, Race, and Ethnicity in Study Area and Surrounding Areas (ACS 2015-2019)

Population and Race in Study Area and Surrounding Areas (ACS 2012-2016)											
		Study Area						Manhattan Borough, New York County, NY		New York State	
		Census Tract 97		Census Tract 103		Census Tract 95					
		Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
Race	White	3,080	62.0	1,351	65.4	2,659	84.6	922,033	56.5	12,459,687	63.7
	Black/African American	132	6.4	499	10.0	92	2.9	240,993	14.8	3,065,471	15.7
	American Indian and Alaska Native	0	0.0	0	0.0	16	0.5	6,178	0.4	79,512	0.4
	Asian	961	19.3	475	23.0	343	10.9	198,833	12.2	1,647,606	8.4
	Hawaiian/Pacific Islander	0	0	21	1.0	0	0	888	0.1	8,821	0.0
	Other	141	2.8	10	0.5	15	0.5	188,400	11.5	1,694,965	8.7
	Two or more races	287	5.8	76	3.7	17	0.5	74,668	4.6	616,257	3.1
TOTAL		4,968		2,065		3,142		1,631,993		19,572,319	
Population and Ethnicity in Study Area and Surrounding Areas (ACS 2012-2016)											
		Study Area						Manhattan Borough, New York County, NY		New York State	
		Census Tract 97		Census Tract 103		Census Tract 95					
		Pop.	%	Pop.	%	Pop.	%	Pop.	%	Pop.	%
Ethnicity	Hispanic/ Latino	1,154	23.2	118	5.7	260	8.3	421,540	25.8	3,720,983	19.0

Source: American Community Survey, DP05, 2019 5-Year Estimates Data Profiles

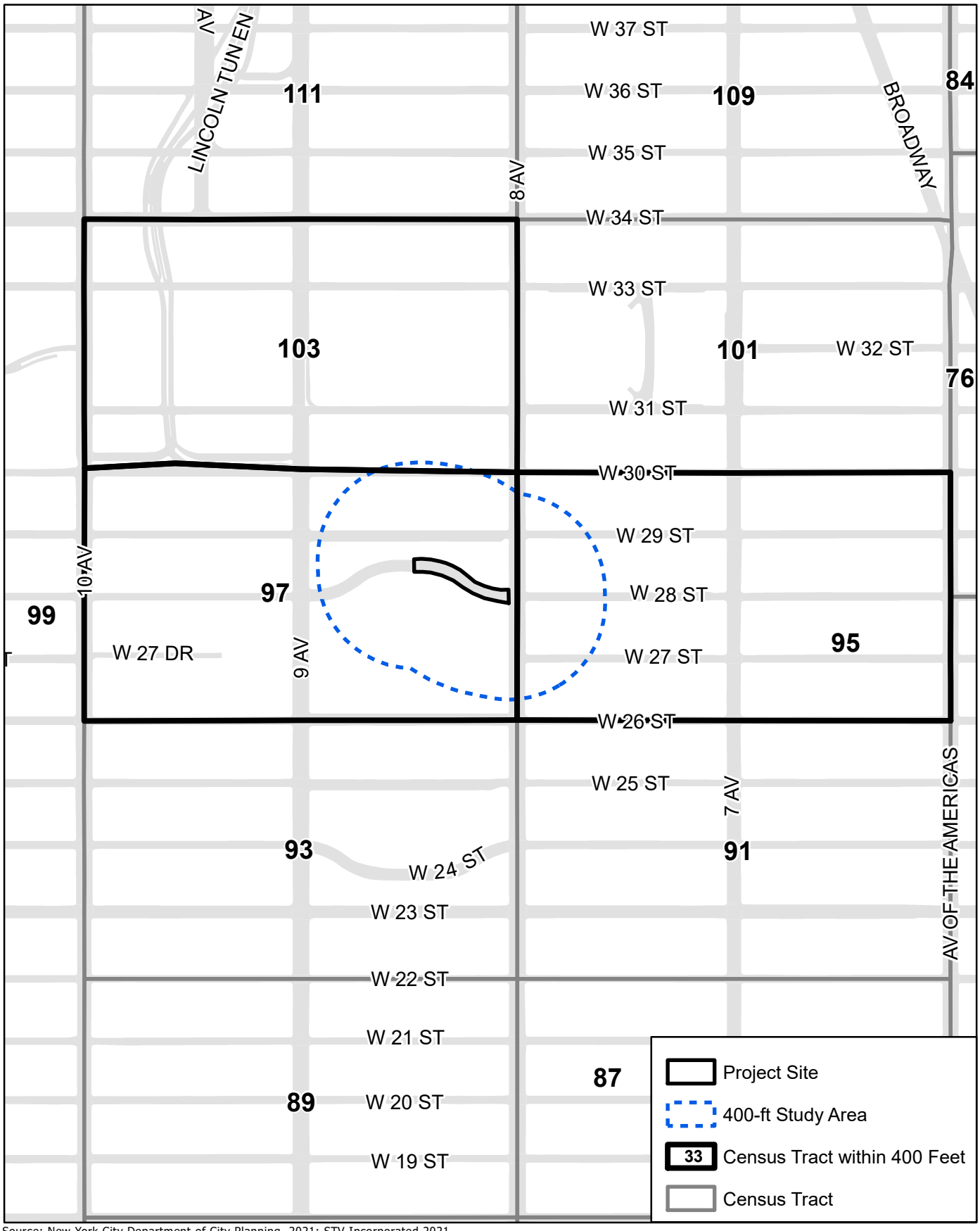
2.2.3 Income Demographics

According to federal poverty guidelines issued by the U.S. Department of Health and Human Services ("HHS"), in 2021 a four-person household with an income equal to or less than $26,500 was considered to be living below poverty. As shown in **Table 2.3, "Mean Income in Study Area and Surrounding Areas (ACS 2015-2019),"** the mean household income in Census Tract 97 is $99,921, well above the 2021 household income definition for poverty. The surrounding census tracts also have mean incomes above the poverty level.

Table 2.3: Mean Income in Study Area and Surrounding Areas (ACS 2015-2019)

Mean Income in Study Area and Surrounding Areas (ACS 2012-2016)					
	Study Area			Manhattan Borough, New York, NY	New York State
	Census Tract 97	Census Tract 103	Census Tract 95		
Mean Income ($)	$ 99,921	$ 135,693	$ 270,420	$ 159,579	$ 101,945

Source: American Community Survey, S1901, 2019 ACS 5-Year Estimates Subject Tables



Source: New York City Department of City Planning, 2021; STV Incorporated 2021.

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Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.3

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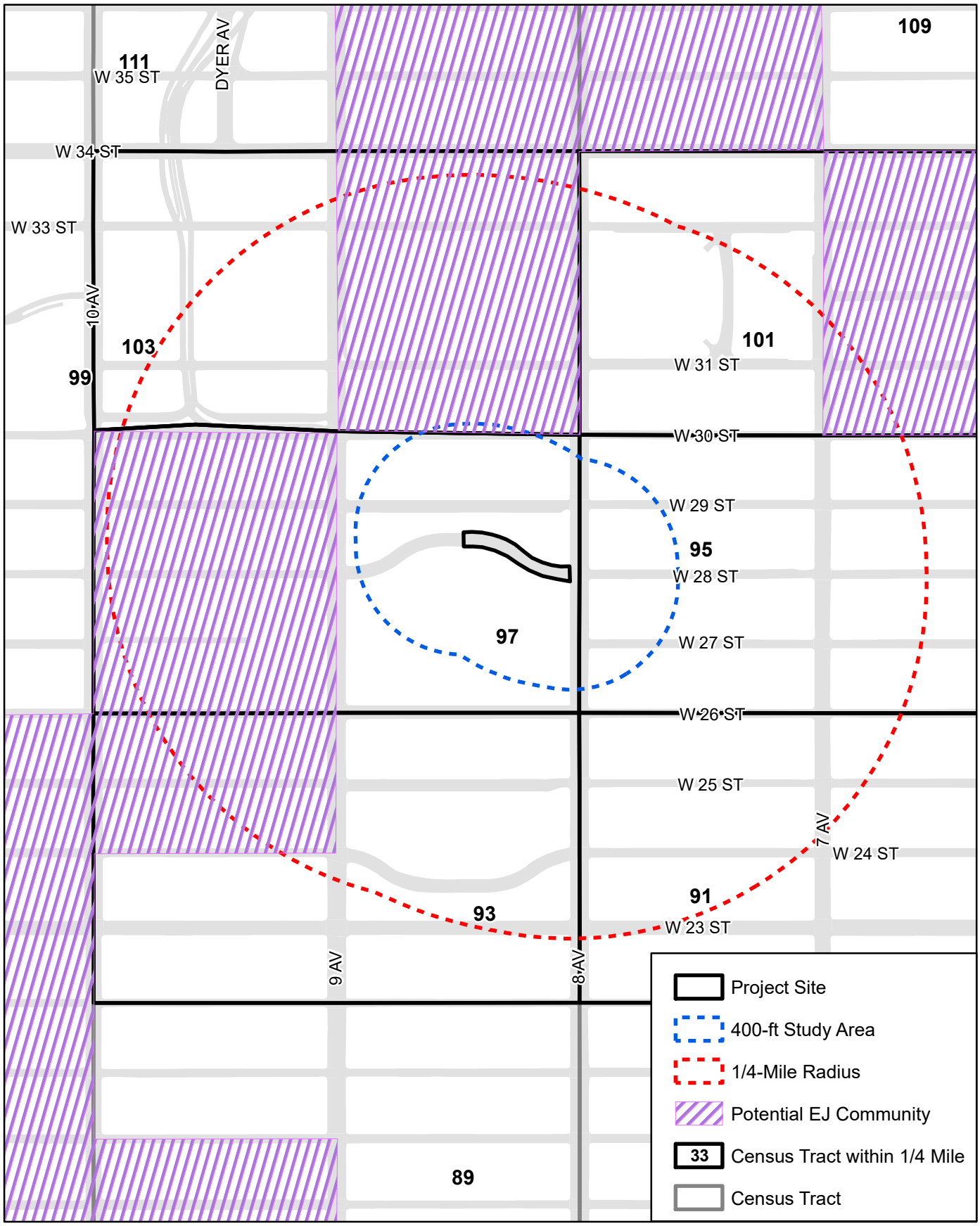
SOCIOECONOMIC CONDITIONS

2.3 ENVIRONMENTAL JUSTICE

Issued on February 11, 1994, Executive Order ("E.O.") 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects that its programs, policies, and activities may have on minority and low-income populations. Guidance on addressing Environmental Justice and providing analysis to determine potential effects to communities is also provided in NYSDEC Commissioner Policy 29 (CP 29). An environmental justice analysis addresses environmental justice concerns and ensures community participation in the NYSDEC permit review process and the NYSDEC application of the New York State Environmental Quality Review Act ("SEQRA"), when applicable, particularly in instances where there is potential for a community, qualifying as "Environmental Justice Communities" (based on race, ethnicity, or income) to experience adverse effects associated with an action. No such potential communities have been identified in the Project Site, according to NYSDEC environmental justice guidance. However, as shown on **Figure 2.4, "Environmental Justice Areas,"** the 400-foot radius study area encompasses a portion of one potential environmental justice community.



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

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MTA Construction and Development

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.4

ENVIRONMENTAL JUSTICE COMMUNITIES

2.4 COMMUNITY FACILITIES

Community facilities are public or publicly funded facilities, such as schools, hospitals, libraries, day care centers, and fire and police protection. As shown on **Figure 2.5.1, "Public Schools and Libraries,"** and **Figure 2.5.2, "Police, Fire House, Emergency Service, and Healthcare Facilities,"** there are community facilities located adjacent to the Project Site, within Penn South, along West 28th Street, as well as within a 0.5-mile radius of the Project Site there are other community facilities.

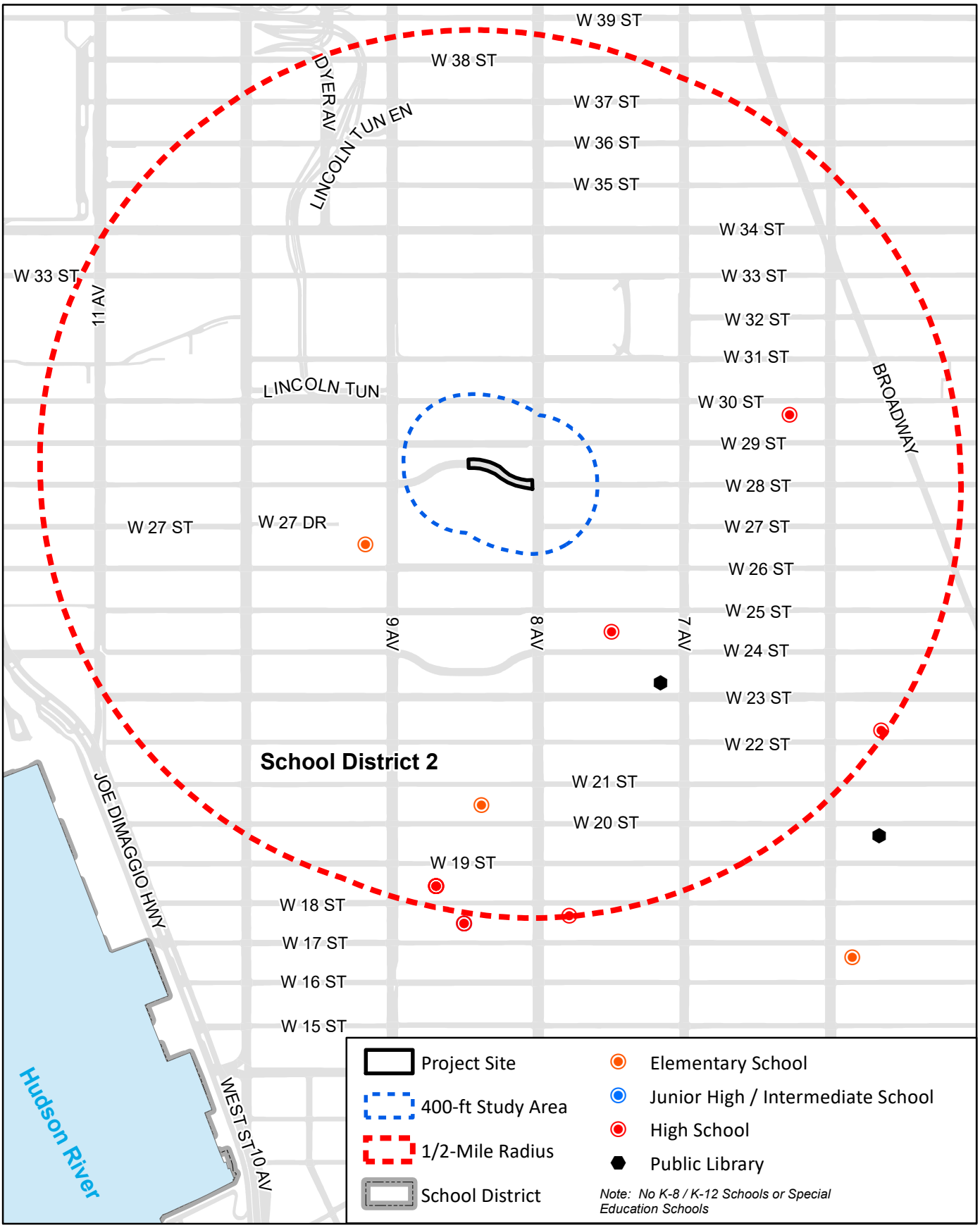
The Project Site is located within Manhattan School District 2, as shown on **Figure 2.5.1, "Public Schools and Libraries."** Within a 0.5-mile radius of the Project Site, there are two elementary schools, PS 33 Chelsea Prep Elementary School and Saint Michael's Academy, four High Schools, including the High School for Fashion Industries and one Public Library, the Muhlenberg Library, as well as FIT, are located within a 0.5-mile radius of the Project Site.

2.4.1 Fire and Police Services

The Police and Fire Stations located nearest to the Project Site are the 14th Precinct, located at 357 West 35th Street, and the Fire Department of the City of New York ("FDNY") Ladder 24, located at 142 West 31st Street.

2.4.2 Hospital Services

There are medical services available adjacent to the Project Site, within Penn South, along West 28th Street, including a family and cosmetic dentist office and the AHP Chelsea Healthcare Center. There are hospitals located within a 0.5-mile radius. These include a series of medical clinics (healthcare facilities) and hospitals that serve the surrounding community including New York Presbyterian Hospital located on West 23rd Street, Mt Sinai Comprehensive Health located on 7th Avenue between West 25th and West 26th Streets, the District Health Center located on West 28th Street between 9th and 10th Avenues.



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

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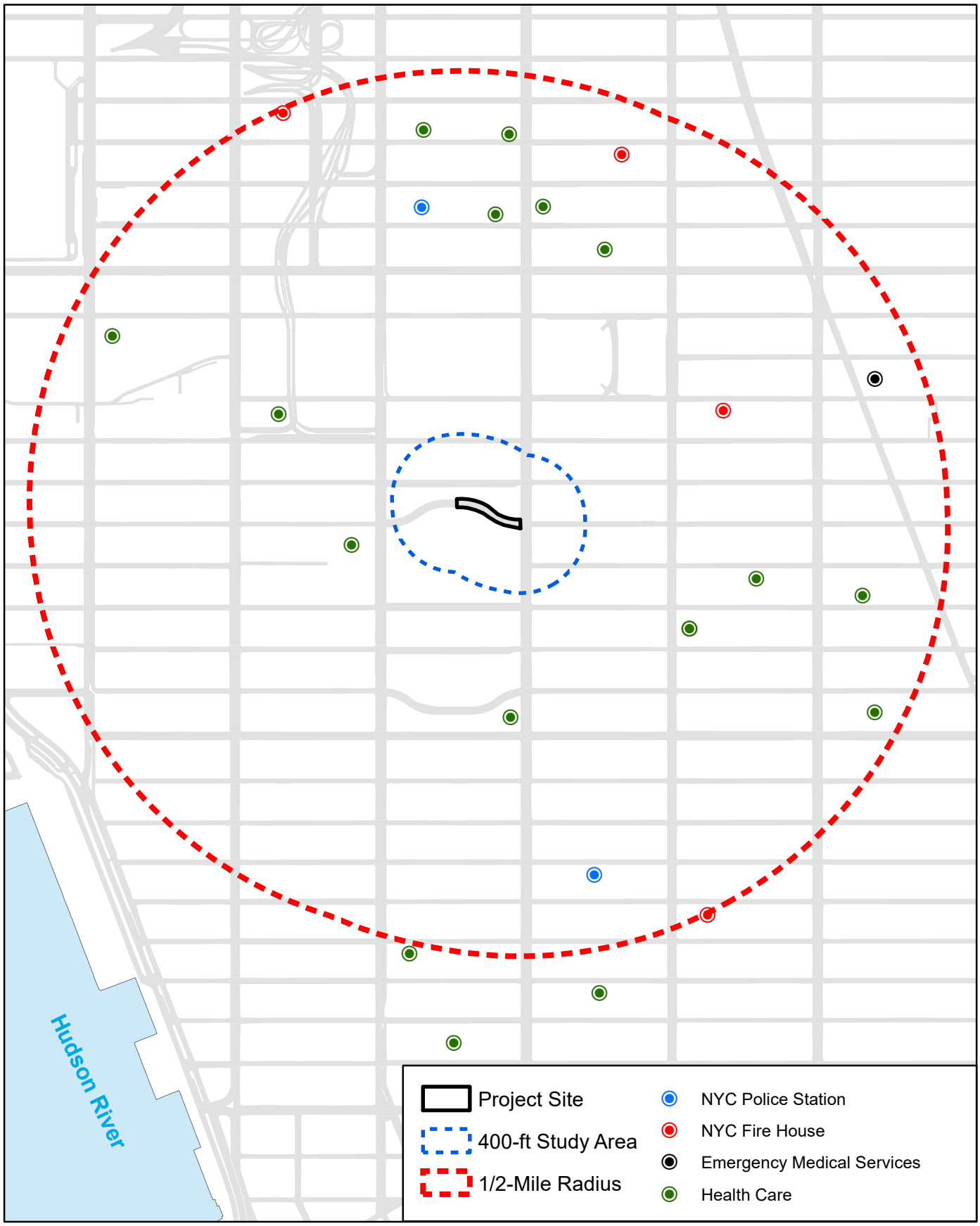
Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.5.1



Source: New York City Department of City Planning, 2022;
STV Incorporated, 2022.

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MTA Construction and Development

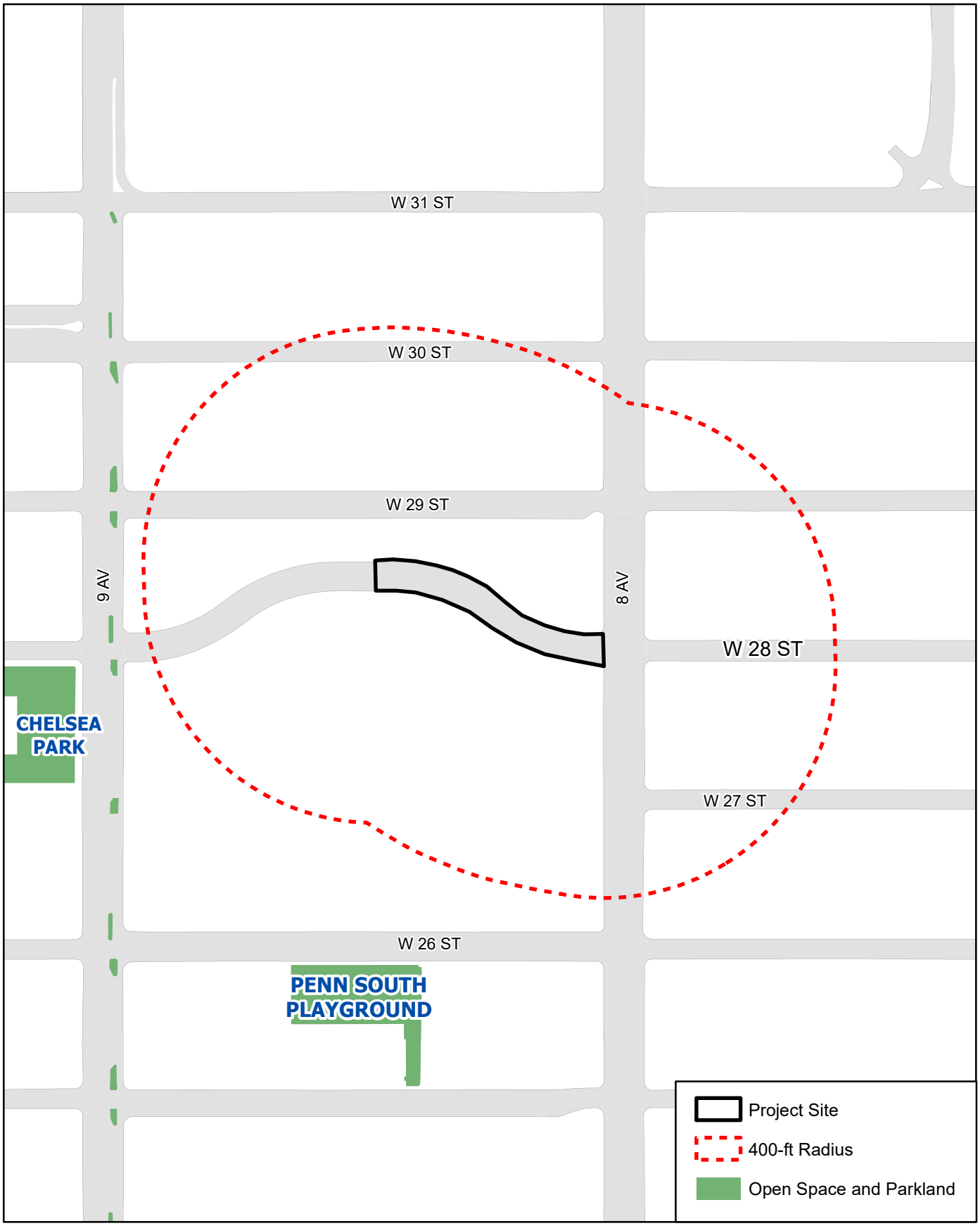
Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.5.2

POLICE, FIRE HOUSE, EMERGENCY SERVICE, AND HEALTH CARE FACILITIES

2.5 OPEN SPACE AND PARKLAND

There are two public open spaces and parks used for passive and active recreation located within the vicinity of the Proposed Project. As shown on **Figure 2.6, "Open Space/Parkland,"** Chelsea Park is located approximately 1,000 feet west of the Project Site and the Penn Station South Houses Playground is located approximately 600 feet south of the Project Site. Chelsea Park was acquired by New York City Department of Parks and Recreation ("NYCDPR") over 100 years ago, providing a green space and recreational facilities for residents of the surrounding tenement housing. A World War I memorial statue, the Doughboy, is located in this park. The park provides both active and passive recreational opportunities. The Penn Station South Playground, located at West 25th Street, takes name from Penn Station and provides active recreational opportunities.



Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

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Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.6

OPEN SPACE / PARKLAND

2.6 HISTORIC AND CULTURAL RESOURCES

2.6.1 Historic and Architectural Resources

The Project Site is currently a paved city street that passes through Penn South, which was constructed in 1962 and 1963. Within the complex there are ten residential buildings, each 22 stories. As shown on **Figure 2.7, "Historic and Cultural Resources,"** along West 28th Street, Penn South Buildings 9 and 10 are situated to the north, and Penn South Buildings 7 and 8 are immediately south.

The Penn South development was laid out with lawns and landscaped gardens between buildings and adjacent streets. A line of mature trees, separated from the public sidewalk by wrought iron fencing that demarcates Penn South's boundaries, flank both sides of West 28th Street. Breaking with the standard rectangular grid system that dominates Manhattan north of 1st Street, both West 28th Street and West 24th Street within the complex were altered from their original straight configuration and redesigned to gently curve around buildings when the development was erected.

The Area of Potential Effect ("APE") for historic and architectural resources is limited to the Project Site. A Phase I Cultural Resources Study was performed to determine the presence, type, extent, and potential significance of resources that may have been present in the APE (**Appendix A, "Phase I Cultural Resources Study"**). A file search for historic and architectural resources indicated that Project Site is not situated within a federal or state listed historic district. However, as shown on **Figure 2.7, "Historic and Cultural Resources,"** the Project Site is located within the Penn South Complex, a State/National Register of Historic Places ("S/NR") Eligible historic site ("Penn South Complex 23rd 29th Streets, Eighth-Ninth Aves"). Within the immediate vicinity of the Proposed Project (i.e., within 90 feet of the APE), there is one S/NR listed historic site – Bayard Rustin Apartment - 340 West 28th Street (Bldg. 7B Penn South) – as well as two S/NR Eligible historic sites – 355 Eighth Ave. (Bldg. 8B Penn South); and 305 West 28th Street (Bldg. 9 Penn South).[2]

In addition to these resources located within the immediate vicinity of the Proposed Project, there are eight historic resources within 400 feet of the APE. The Church of Holy Apostles, located within approximately 390 feet to the west of the Project Site, is both an S/NR and New York City Landmarks Preservation Commission ("LPC") listed historic site. The Former French Hospital, located approximately 175 feet to the north of the Project Site, is eligible for inclusion on the S/NR Register of Historic Places. Hotel Irvin, located approximately 200 feet to the north of the Project Site, is eligible for inclusion on the S/NR Register of Historic Places. One historic district, the Lamartine Historic District, located approximately 150 feet northwest of the Project Site, is both LPC and S/NR-eligible. Five other buildings within the Penn South Complex – Penn South Building 7A (S/NR Listed), Penn South Building 8A (S/NR

[2] The full breadth of the Penn South development is between Eighth and Ninth Avenues, and 23rd and 29th Streets. There are ten residential buildings in all, with each tower having 22 floors. Connected Buildings 7A and 7B are located just north of the parking lot and each is listed on the S/NRHP due to the presence of the S/NRHP listed Bayard Rustin Apartment, which is also a NYCL. Terrain around Buildings 7A and 7B is also included in the designation.

Eligible), Penn South Building 8B (S/NR Eligible), Penn South Building 9 (S/NR Eligible), and Penn South Building 10 (S/NR Eligible) – are within 400 feet of the APE. Additionally, the S/NR Eligible Art Deco Loft, 249-251 West 29th Street, is located approximately 370 feet to the northeast of the APE. These historic resources are summarized in **Table 2.4, "S/NR Listed and LPC Designated Structures and Districts in the Study Area."**

Table 2.4: S/NR Listed and LPC Designated Structures and Districts in the Study Area

Resource/Resource #	S/NR Site or District	LPC Site or District	Within APE or /90-feet of APE	Within 400-feet of APE
355 West 29th Street (Lamartine Historic District) (1)		Listed District		Yes
333 – 353 West 29th Street (Lamartine Historic District) (2-12)	Eligible District	Listed District		Yes
Former French Hospital – 326-330 West 30th Street (13)	Eligible Site			Yes
Art Deco Loft, 249-251 West 29th Street (22)	Eligible Site			Yes
Hotel Irvin, 308 West 30th Street (23)	Eligible Site			Yes
Bayard Rustin Apartment - 340 West 28th Street (Bldg. 7B Penn South) (14)	Listed Site		Yes	
Penn South Complex 23rd-29th Streets, 8th-9th Avenues (15)	Eligible Site		Yes	
Church of the Holy Apostles 298/300 9th Avenue (16)	Listed Site	Listed Site		Yes
330 West 28th Street (Bldg. 7A Penn South) (17)	Listed Site			Yes
345 8th Avenue (Bldg. 8A Penn South) (18)	Eligible Site			Yes
355 8th Avenue (Bldg. 8B Penn South) (19)	Eligible Site		Yes	
305 West 28th Street (Bldg. 9 Penn South) (20)	Eligible Site		Yes	
365 West 28th Street (Bldg. 10 Penn South) (21)	Eligible Site			Yes

Note: Bold outline indicates individual resources that are part of the larger N/SR-eligible Penn South Complex.

Source: New York State Cultural Resource Information System (NYSCRIS), 2021.

The IND Division A/C/E Subway Line was constructed in the late 1920s and opened in 1932. It was constructed beneath Eighth Avenue immediately east of the APE. It was the first line of the IND system and was built using the cut-and-cover method of construction rendering the footprint of Eighth Avenue completely disturbed. This section of the subway line is four tracks wide, with the closest stations located at West 34th Street to the north, and West 23rd Street to the south.

2.6.2 Archaeological Resources

The APE for archaeology is limited to the Project Site (see **Figure 2.7, "Historic and Cultural Resources"**). A Phase I Cultural Resources Study (**Appendix A, "Phase I Cultural Resources Study"**) was performed to determine the presence, type, extent, and potential significance of archaeological resources that may have been present in the APE, as well as the likelihood that any area resources have survived post-depositional disturbances such as construction, re-grading, redevelopment, and other land uses that may have accompanied subsequent development. If archaeological resources are present and have survived, their potential integrity would also be considered.

The Phase I Cultural Resources Study entailed a review of cartographic sources and historical accounts available from the New York Public Library Digital Collection (digitalcollections.nypl.org), the New York City Municipal Archives (nycma.lunaimaging.com), the David Rumsey Map Collection (www.davidrumsey.com), Historic Aerials (www.historicaerials.com), and the New York Times Archives (www.nytimes.com).

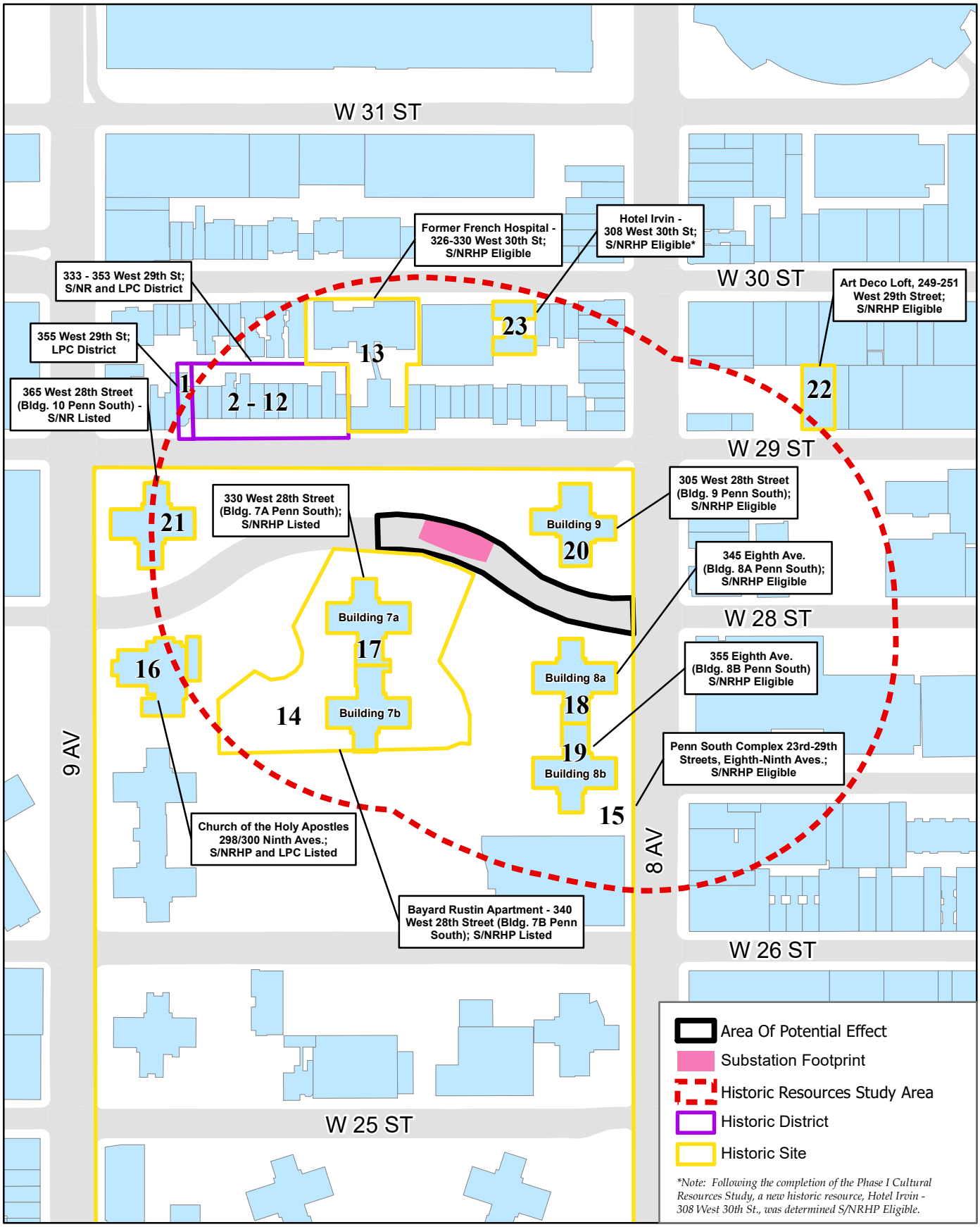
Land use history was established through the cartographic review through the New York Public Library and various other websites. Photographs of the Project Site over time were reviewed using the New York Public Library's Digital Gallery and other websites. New York City Department of Buildings ("DOB") records for the APE were reviewed through their NYC DOB's BIS website. Selected historic newspapers were searched for information about mid-nineteenth century development in the APE. Previously reported archaeological sites and completed surveys were reviewed using data available at LPC (www1.nyc.gov/site/lpc) and OPRHP. A site file search for all listed and eligible historic sites and districts were undertaken using through New York Cultural Resource Information System ("NYCRIS").

Archaeological potential depends, in part, on the degree of later disturbance to the location of potential resources. Prior to development, the APE was in marshland interspersed by streams. Native Americans would have been drawn to these streams and marshlands for their aquatic life, wild game, and vegetation. Further, wetlands peat could have been used for fuel and a number of wetland plants served as materials for clothing, basketry and weaving.

Soil borings logs from borings taken from the Project Site adjacent to and within the APE were provided. These borings show fill levels from the surface down to depths of between eight and fourteen feet below grade containing silt, sand, brick fragments, and an occasional fragment of asphalt. Beneath this were levels of sand and gravel, some containing traces of silt. No evidence of a buried natural horizon or peat layer were reported in any of the boring logs (ADT 2017).

The new power substation, which is proposed to supply traction power to the IND Division A/C/E Subway Line, has no potential for precontact archaeological resources in the APE. A review of maps and atlases from the historical period indicates that the APE was once a slope, later intensively developed with circa 1854 or 1857 row houses, and is now level, hence it has experienced extensive subsurface disturbance. Therefore, there is no potential for an undisturbed precontact deposit in the APE and construction would cause no impacts.

There is also no sensitivity for historical period archaeological resources in the APE due to lack of deposition and the degree of nineteenth-century disturbance. Although a residence once stood immediately northwest of the APE, any potential subsurface features that may have once been associated with it were likely in the rear yard, north of the APE. Furthermore, any features would have been subjected to post depositional disturbances by grading the hill, the construction of row houses with basements and cellars, and the leveling of West 28th Street over the former location of the row houses. Therefore, there is no sensitivity in the APE for intact archaeological deposits related to this early nineteenth-century dwelling.



Source: New York State Cultural Resource Information Service, 2022; STV Incorporated, 2022.

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0 100 200 400 Feet

MTA Construction and Development

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.7

HISTORIC AND CULTURAL RESOURCES

2.7 URBAN DESIGN AND VISUAL RESOURCES

The assessment of urban design and visual resources focuses on the components of a Proposed Project that could potentially alter the arrangement, appearance, and functionality of the built environment. A project could result in adverse visual effects if it would negatively affect a pedestrian's experience of the area. Existing conditions in the study area were surveyed during a field visit and potential impacts were assessed qualitatively. Currently, the Project Site encompasses the roadbed and sidewalks.

2.8 NATURAL RESOURCES

Existing natural resources located within the Project Site and study area are described, based on a desktop survey of available natural resource websites, including the following information sources (reports and maps) including:

- United States Geological Survey ("USGS") – Topographic Quadrangle (Jersey City NJ-NY, Quad).
- NYSDEC – Breeding Bird Atlas Survey, Bird Conservation Areas, Critical Environmental Areas.
- Aerial photographs.
- United States Fish and Wildlife Service ("USFWS") and New York Natural Heritage Program ("NYNHP") – Information on rare, threatened, or endangered species within the vicinity of the District. A study area of a 0.5-mile radius around the Project Site was assessed and included an evaluation of both terrestrial and aquatic resources.
- NYC Street Tree Map.
- U.S. Fish and Wildlife Service National Wetlands Inventory ("NWI") mapping.

The topography of the study area is relatively level, with less than ten feet of elevation variation. The waterbody nearest to the Project Site is the Hudson River, located approximately 3,000 feet west. Wildlife likely to utilize the Project Site and study area include those species generally tolerant to urban conditions. Soils underlying the Project Site consist primarily of fill material.

2.8.1 Vegetation

The Project Site contains developed areas consisting of impervious surfaces (e.g., pavement, concrete and structures). There are fenced off open spaces with turf, flowers, shrubs and trees associated with Penn South. At the intersection of 9th Avenue and West 28th Street there are a few street trees, which did not appear to be in good condition and are not shown on the NYC Street Tree Mapping. In addition, there are single trees located in the refuge islands located at the intersection of 8th Avenue and West 28th Street. The two trees, both Japanese zelkova (*Zelkova serrata*), will be impacted by the construction activities. As highlighted in **Chapter 7, "Permits and Approvals,"** coordination with NYCDPR for permits will be required for the project.

2.8.2 Wildlife

Wildlife likely to utilize the Project Site include those species generally tolerant of urban conditions. **Table 2.5, "Birds with the Potential to Breed within the District,"** lists birds identified as breeding within the New York State Breeding Bird Atlas Block 5751D (2000 and 2005 Breeding Bird Atlas Survey), which includes the Project Site, and contains species that could potentially breed in successional vacant lot habitats within New York City. There are no Bird Conservation Areas within several miles of the Project Site. Other wildlife tolerant of urban conditions with the potential to occur in the vicinity of the Project Site and study area include rats, mice, opossums, raccoons, and squirrels.

Table 2.5: Birds with the Potential to Breed within the District

Common Name	Scientific Name
Confirmed Breeders	
American Kestrel	*Falco sparverius*
Rock Pigeon	*Columba livia*
Mourning Dove	*Zenaida macroura*
Northern Mockingbird	*Mimus polyglottos*
European Starling	*Sturnus vulgaris*
Northern Cardinal	*Cardinalis cardinalis*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*

Source: NYSDEC. New York State Breeding Bird Atlas. 2000-2005.

2.8.3 Geology and Soils

Manhattan is underlain by intensely folded and faulted metamorphic rocks. These rocks range in age from lower Paleozoic [Ordovician & Cambrian; 500-545 million years (Ma)] to latest Proterozoic (545-1,000 Ma) and consist of three formations (from oldest to youngest): the Fordham Gneiss, Inwood Marble, and Manhattan Schist. Together they comprise the New York City Group and the topography of Manhattan is in large part controlled by the plunging brows and crests of these three rock types.

The Project Site is underlain by fill material generally consisting of gray, brown, and reddish brown sand, medium gray gravel, silt, brick, and asphalt was encountered in borings from the ground surface (beneath concrete or asphalt cover) to maximum depths ranging from 8 to 20 feet below ground surface ("bgs"). Underlying native material generally consisted of medium brown sand, gravel, and trace silt followed by silt, silty sand, and clayey silt. Slightly weathered to weathered bedrock with fractures (Manhattan schist) was encountered at depths ranging from 25 to 35 feet bgs.

As shown on **Figure 2.8, "Soil Survey,"** the Project Site soils are classified as Urban Land-Greenbelt Complex ("UGAI"). Urban Land refers to soils that have been altered by human activities thus making them unidentifiable. Typically, these soils have been mixed with other materials, such as brick and concrete (urban fill), and characteristics can only be determined by on-site investigation. Other surficial and shallow soil types in the area of the Project Site consist of sandy loam. Sandy loam refers to a soil that's made of sand, silt, and clay.

2.8.4 Floodplains and Wetlands

The Project Site is urban in nature and is developed. **Figure 2.9, "Flood Zones,"** presents the 100-year (area with a one percent chance of flooding each year) and 500-year (area with a 0.2 percent chance of flooding each year) floodplain boundaries in the vicinity of the Project Site. As shown, the project is not located within the 100-year floodplain.

There are no freshwater or tidal wetlands mapped by the NYSDEC or USFWS National Wetland Inventory within the Project Site or within a 400-foot radius study area. High and intertidal marshes, as identified by NYSDEC, do not exist within the study area.

2.8.5 Groundwater

Previous environmental investigations in the general area of the Project Site indicate that groundwater is typically encountered at approximately fifteen feet below ground surface and generally flows to the southwest. The groundwater in the vicinity of the Project Site is not known to be used for human consumption, as potable water in surrounding area is derived from upstate reservoirs.

2.8.6 Aquatic Resources

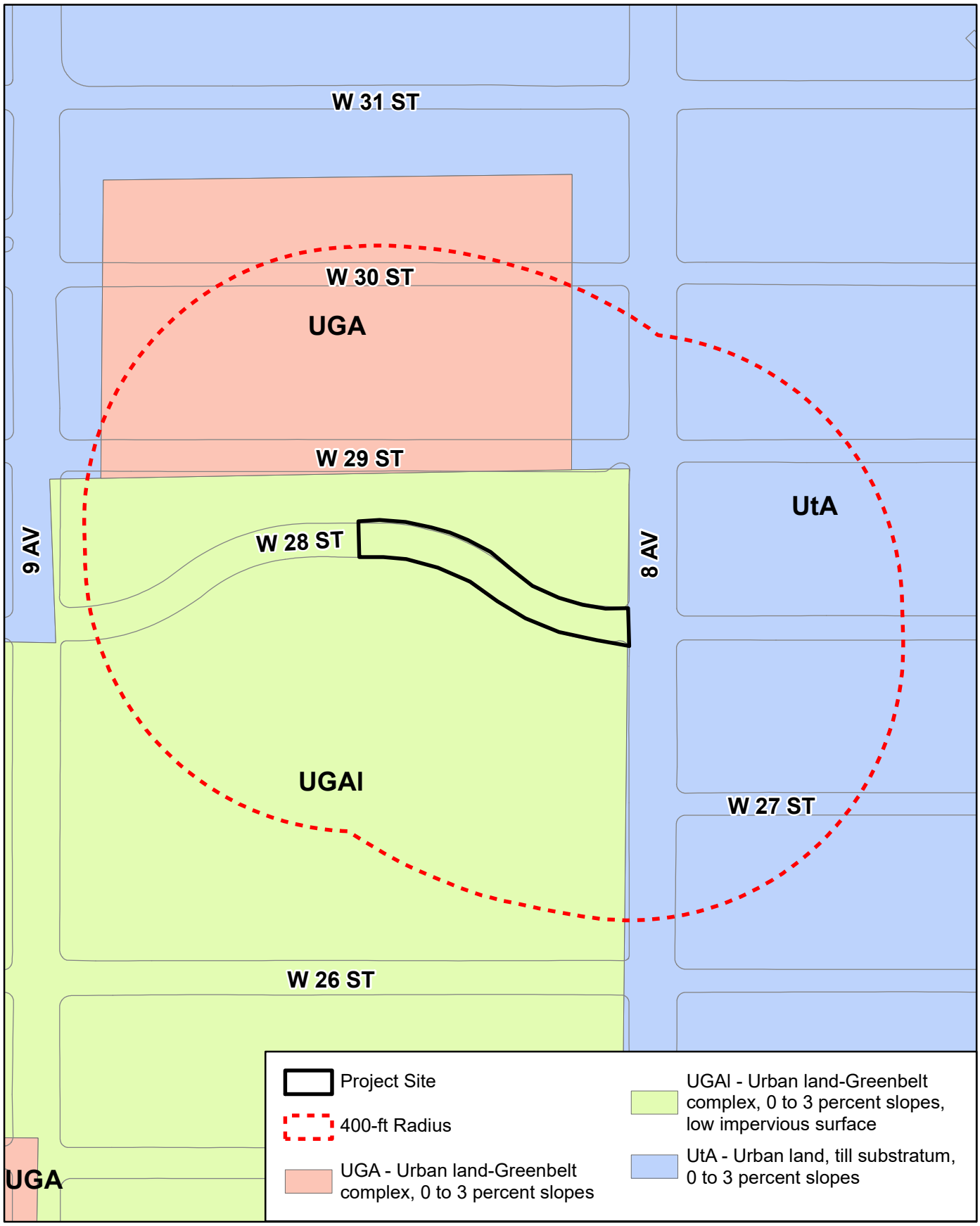
There are no aquatic resources on or adjacent to the Project Site or within a 400-foot radius.

2.8.7 Water Quality

There are no surface waters on or adjacent to the Project Site.

2.8.8 Threatened, Endangered, and Special Concern Species

Information on rare, threatened, or endangered species within a 400-foot radius around the Project Site was obtained from available USFWS and NYNHP resources. Information obtained from these agencies indicates that within the vicinity of the Project Site there is potential for the presence of habitats for two candidate threatened and endangered species, the Monarch Butterfly (*Danaus plexippus*) and the Yellow Bumble Bee (*Bombus fervidus*).



Source: Natural Resources Conservation Service, Web Soil Survey
National Cooperative Soil Survey, 2021; STV Incorporated, 2022.

N

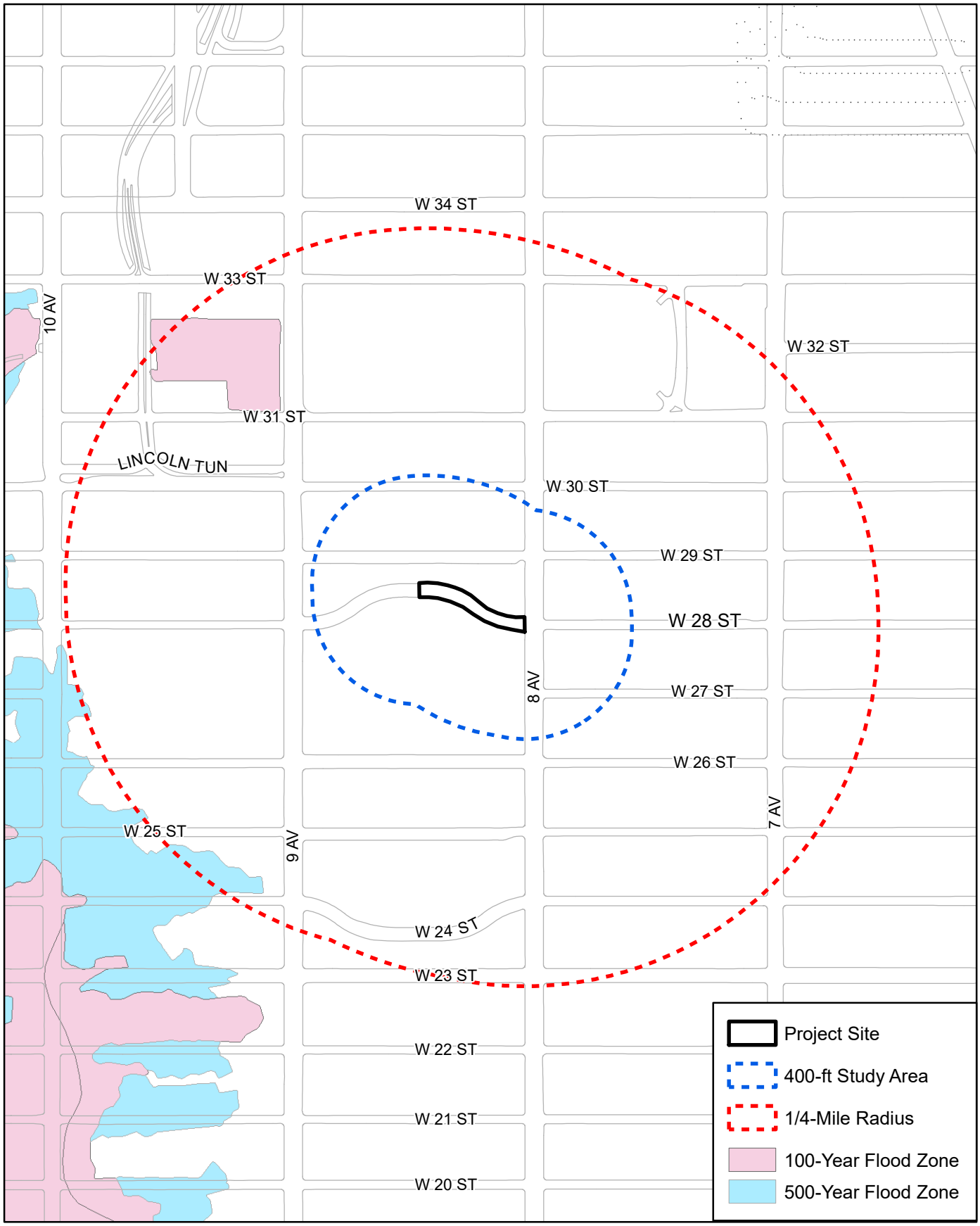
0 100 200 400 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.8

SOIL SURVEY

MTA Construction and Development



Source: FEMA, 2015; STV Incorporated, 2022.

N

0 250 500 1,000 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.9

FLOOD ZONES

MTA Construction and Development

2.9 HAZARDOUS MATERIALS

A Phase I Environmental Site Assessment identified the potential presence of hazardous materials at the Project Site and in the study area (prior to reconfiguration of West 28th Street in the 1960's). Recognized environmental conditions ("RECs") include the potential presence of historic fill material at the Project Site. Additionally, portions of the study area were historically developed with facilities that used hazardous chemicals and petroleum products. Undocumented releases from these facilities may have impacted soil and groundwater. (See **Appendix B, "Phase I ESA."**)

Identified RECs include:

On-Site RECs

- Structures were present on the Project Site, which were demolished. Historic fill of unknown origin and suspect buried structures have potential to impact the Project Site.

Off-Site RECs

- Historic presence of nearby properties that were utilized for publishing and printing, woodworking, manufacturing (i.e., buckle factory, iron works), as paint shops, furriers, facilities utilized for "junk", and as garages with gasoline tanks.

- Historic dry cleaners ("ES Cleaners" and "New York School of Dry Cleaning") and a registered dry cleaner ("Penn House Cleaners") were located in close proximity to the Project Site. The "New York School of Dry Cleaning", was listed in the New York Spills database for releases of dry cleaning chemicals in the Resource Conservation and Recovery Act ("RCRA") Small Quantity Generator ("SQG"), New York and Rhode Island Manifest, Facility Index System/Facility Registry System ("FINDS"), Enforcement and Compliance History Information ("ECHO"), and Integrated Compliance Information System ("ICIS") databases for hazardous solvent waste generation and with compliance violations; it has an environmental ("E") zoning designation requiring environmental investigation.

- The historic presence of a lead smelter ("Tottenville Copper Co.") located in close proximity to the Project Site.

2.10 INFRASTRUCTURE AND UTILITIES

The construction of a new substation would require relocation of utilities (e.g., sewer, water, telecommunications, and electricity) under and in the vicinity of the Project Site. Based on a utilities plan provided by the MTA C&D Design Team, a detailed description of the layout of the currently known utilities in the study area is presented below.

Sanitary and Storm Sewer

- An existing 48-inch diameter sewer line is located south of the Project Site. According to the plans provided by the MTA C&D, the line runs approximately east to west within the Penn South property and enters the roadbed of West 28th Street approximately 100 feet east of the 8th Avenue intersection in Tax Block 751, Lot 1.

Water

- A 12-inch diameter water line constructed in 1993 is located within West 28th Street and connects to a 12-inch line under 8th Avenue that was constructed in 1983.

Telecommunications

- An existing 3-inch telecommunications duct is located within West 28th Street on the southern side of the proposed substation. It connects to three 3.5-inch telecommunications ducts in 8th Avenue.

Electricity

- Two Con Edison 4-inch electric ducts are located on the north side of West 28th Street. These connect to a vault on the western side of West 28th Street.

The Penn South buildings are also connected by a utility corridor carrying electrical lines and water lines located approximately 30 feet east of the Project Site. These are privately owned and run north to the south.

2.11 SAFETY AND SECURITY

MTA C&D complies with all applicable federal and state regulations. Further, MTA C&D has developed processes and procedures to ensure the safety and security of employees, transit riders, and the general public. These processes and procedures are incorporated into the System Safety Program Plan, which governs all MTA C&D facilities during construction and operations. MTA C&D staff and contractors are trained in all appropriate construction safety procedures under this plan. During construction written Safe Work Plans and MPT would be developed by the contractors to identify potential hazards and safety measures that would be implemented to protect the health and safety of workers and the general public. During the operational phase of the Proposed Project, the substation would be secured, and access restricted to authorized MTA C&D personnel and contractors.

2.12 ENERGY REQUIREMENTS AND POTENTIAL FOR CONSERVATION

MTA C&D improves environmental performance through an Environmental Management System ("EMS") certified in compliance with International Organization for Standardization ("ISO") 14001 requirements. MTA C&D integrates the ISO 14001 framework into its environmental programs to adhere to applicable environmental laws and regulations and reduce the environmental impact of MTA C&D's activities within construction and subsequent operational phases.

The New York State E.O. 111 for "Green and Clean State Buildings and Vehicles" was issued in 2001. MTA C&D complies with E.O. 111, as applicable, by setting goals for energy efficiency, renewable energy, green building design, and alternate fuel vehicles. MTA C&D has developed Design for Environment ("DfE") Guidelines which outline sustainable design features to be considered in new designs and construction projects, including energy efficiency, material conservation, water and site management, indoor environmental quality and operation and maintenance.

2.13 TRAFFIC, TRANSIT, PARKING, AND PEDESTRIANS

This section presents the findings of the assessment of the potential impacts of the construction and operation of the proposed West 28th Street Substation on traffic, transit, parking, and pedestrian operations. Following is a description of the relevant study areas, analysis methodologies, and affected environment for each transportation element.

2.13.1 Study Area

The traffic study area for the West 28th Street substation is West 28th Street between 8th and 9th Avenues as shown on **Figure 2.10, "Traffic Study Area."**

West 28th Street is a one-way eastbound street classified as a major collector roadway. The curb-to-curb roadway width is approximately 50 feet. West 28th Street operates between Route 9A (12th Avenue) to the west and the FDR Drive access road to the east. On the eastbound approach to 9th Avenue, West 28th Street provides one eastbound lane and curbside parking along the north and south curbs. Between 8th Avenue and 9th Avenue, West 28th Street provides two eastbound lanes and curbside parking along the north and south curbs.

Eighth Avenue is a one-way northbound urban principal arterial. The curb-to-curb roadway width is approximately 70 feet. Eighth Avenue provides four northbound through lanes at the approach to West 28th Street, in addition to a northbound bicycle lane protected by parking along the west curb and parking along the east curb.

Ninth Avenue is a one-way southbound urban principal arterial. The curb-to-curb roadway width is approximately 70 feet. Ninth Avenue provides three southbound through lanes and one left-turn pocket at the approach to West 28th Street, in addition to a southbound bicycle lane along the east curb and parking along the west curb.

Source: New York City Department of City Planning, 2022; STV Incorporated, 2022.

N

0 100 200 400 Feet

MTA Construction and Development

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.10

TRAFFIC STUDY AREA

2.13.2 Traffic Conditions

Traffic counts, including manual turning movement/vehicle classification counts, 24-hour automatic traffic recorder ("ATR") machine counts, and pedestrian movements were conducted during the week of April 16, 2018, while schools were in session. The peak periods identified for analysis were the weekday AM, midday ("MD"), and PM hours, between 8-9 AM, 1-2 PM, and 4-5 PM.

Turning movement counts ("TMCs"), including manual turning movement, vehicle classification counts, and pedestrian crosswalk counts were collected at:

- 8th Avenue and West 28th Street
- 9th Avenue and West 28th Street

24-hour automatic traffic recorder ("ATR") data were collected at the following locations adjacent to the proposed substation site:

- 8th Avenue between 27th and 28th Streets
- 9th Avenue between 28th and 29th Streets
- 28th Street between 8th and 9th Avenues

The ATRs were installed for nine consecutive days to provide continuous 24-hour traffic data with data recorded in 15-minute intervals for one complete week and two weekends. The ATR count data were used to adjust TMCs to average weekday conditions and define nighttime and weekend traffic flow levels. The TMCs were collected concurrently with the ATR counts during one representative midweek day for the morning, midday, and afternoon peak periods of 7 to 9 AM, 12 to 2 PM, and 4 to 6 PM. The counts were collected in 15-minute intervals and classified into three vehicle types: passenger cars, buses, and heavy-duty trucks. The peak hour within each peak period was identified by summing the total of the four highest consecutive 15-minute intervals for all study intersections. Pedestrian counts were also collected simultaneous to the TMCs on the north and south sidewalks of West 28th Street between 8th Avenue and 9th Avenue and at the crosswalk and corners of West 28th Street at 8th Avenue.

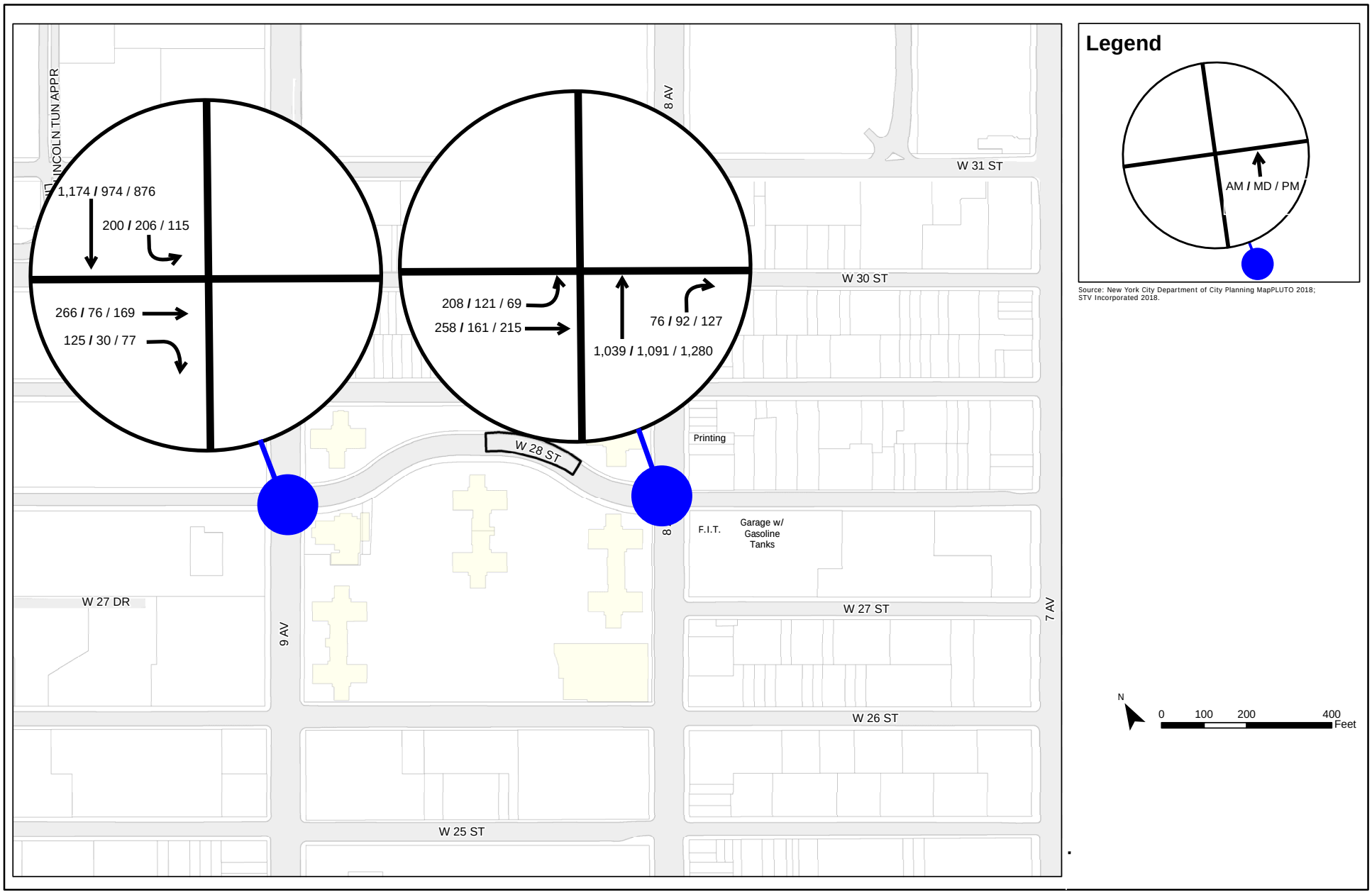
A physical inventory of each study intersection was performed. Field reconnaissance surveys were conducted at these intersections to establish the existing physical characteristics including roadway and lane widths, the number of travel lanes, crosswalk widths, curb parking regulations, lane utilization (turn prohibitions), bus stop locations and signal timing/phasing data. Official intersection signal timing data were obtained from NYCDOT's Traffic Signal Bureau. The timings were field checked at the signalized intersections to verify actual traffic operation conditions. Traffic signal timings were updated within the study area in 2020.

Figure 2.11, "Traffic Volumes – Existing 2018," presents the 2018 existing AM, MD, and PM peak hour traffic volumes through the study area. Along West 28th Street, traffic volumes are generally higher during the AM peak period, likely because of general volume of traffic moving into the Central Business District

("CBD"). Side streets in this area of Midtown have high eastbound volumes as vehicles originating from the Lincoln Tunnel travel across the city toward the CBD. Eastbound West 28th Street is particularly busy during the morning peak with almost 470 vehicles per hour ("vph") traveling eastbound (approximately 285 vph are carried during other peaks) toward the Midtown core.

Northbound 8th Avenue volumes are fairly consistent throughout the day, though there is some peaking during the PM peak hour as traffic leaves the CBD core area. Eighth Avenue traffic volumes peak during the PM peak hour (upwards of 1,400 vph), while about 1,200 vph travel northbound during other study times.

The sidewalks and crosswalks on 8th Avenue at West 28th Street carry modest pedestrian volumes. The flows are directional, with southbound flows peaking during the morning hours away from the Penn Station area (to the north of the study area) and the reverse in the PM. The West 28th Street south sidewalk generally carries approximately 100 more pedestrians walking east and westbound than the north sidewalk. During the peak hours, approximately 220 pedestrians use the south sidewalk.



Source: STV Incorporated, 2022.

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.11

Traffic Volumes - Existing 2018

2.13.3 Analysis Methodology and Results

The *Highway Capacity Manual 2000 ("HCM 2000")* procedures were used to determine the capacities and levels of service for each of the intersections comprising the traffic study area. For a signalized intersection, levels of service are determined for the intersection and its individual lane groups and are defined in terms of the average control delays experienced by all vehicles that arrive in the analysis period, including delays incurred beyond the analysis period when the intersection or lane group is saturated.

The delay levels for signalized intersections are detailed below and in **Table 2.6, "Signalized Intersection LOS Criteria."**

- Level of Service ("LOS") A describes operations with very low delay, i.e., up to 10 seconds per vehicle. This occurs when signal progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.

- LOS B describes operations with delay in the range of 10 to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.

- LOS C describes operations with delay in the range of 20 to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping at an intersection is significant at this level, although many still pass through without stopping.

- LOS D describes operations with delay in the range of 35 to 55 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ("v/c") ratios. Many vehicles stop, and the proportion of vehicles that do not stop declines.

- LOS E describes operations with delay in the range of 55 to 80 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios.

- LOS F describes operations with delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume-to-capacity ratios with cycle failures. Poor progression and long cycle lengths may also be contributing to such delays. Often, vehicles do not pass through the intersection in one signal cycle.

Each of the intersections comprising the traffic study area was analyzed in terms of its capacity to accommodate existing traffic volumes as defined by the resulting levels of service (see **Appendix C, "Transportation Analysis"** for Synchro 10 analyses).

Table 2.6: Signalized Intersection LOS Criteria

Level of Service	Average Delay per Vehicle (Seconds)
A	less than 10.1
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	greater than 80.0

Source: 2000 Highway Capacity Manual

For signalized intersections, LOS A, B, and C are considered acceptable; LOS D reflects the existence of delays within a generally tolerable range in dense urban environments; and LOS E and F indicate levels of congestion.

Data were compiled in the study area for existing conditions as described below. Intersection capacity analyses were conducted at the two key intersections in the study area using the analytical procedures described in the *HCM 2000* and applied via Synchro 10 software. Although this EDDA meets SEQRA requirements, SEQRA has no traffic guidelines; thus, the analysis performed is consistent with the analytical procedures of the *CEQR Technical Manual*, which NYCDOT accepts. The criteria used to define level of service ("LOS") for each type of facility and impact criteria are described in the following sections.

The analyses showed that both of the intersections in the project study area operate at acceptable levels during the AM, MD and PM peak analysis hours (see **Table 2.7, "2018 Existing Traffic Conditions"**).

Table 2.7: 2018 Existing Traffic Conditions

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			MD Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized											
28th Street and 9th Avenue											
28th Street	EB	TR	0.81	40.2	D	0.25	22.4	C	0.60	29.6	C
9th Avenue	SB	L	0.65	41.7	D	0.63	40.8	D	0.39	34.0	C
		T	0.48	13.3	B	0.40	12.4	B	0.38	12.2	B
Overall Intersection		-		**22.4**	**C**		**17.8**	**B**		**17.9**	**B**
28th Street and 8th Avenue											
28th Street	EB	L	0.50	33.1	C	0.30	26.7	C	0.18	16.6	B
		T	0.47	27.9	C	0.28	17.7	B	0.42	15.6	B
8th Avenue	NB	TR	0.45	14.6	B	0.51	16.3	B	0.56	15.9	B
Overall Intersection		-		**19.2**	**B**		**17.3**	**B**		**15.9**	**B**

"Mvt." refers to the specific intersection approach lane(s) and how the lane(s) operate and/or specific pavement striping. TR is a combined through- right turn lane(s), R or L refers to exclusive right- or left-turn movement lane(s), and LTR is a mixed lane(s) that allows for all movement types.

V/C is the volume-to-capacity ratio for the Mvt. listed in the first column. Values above 1.0 indicate an excess of demand over capacity.

Level of service (LOS) for signalized intersections is based upon average control delay per vehicle (sec/veh) for each lane group listed in the Mvt. Column as noted in the 2000 HCM - TRB.

The delay calculations for signalized intersections represent the average control delay experienced by all vehicles that arrive in the analysis period, including delays incurred beyond the analysis period when the lane group is saturated.

2.13.4 Transit

MTA provides bus and subway transit service within the study area (see **Figure 2.10, "Traffic Study Area"**). The 8th Avenue Subway Line (A/C/E) runs north- and south-bound beneath 8th Avenue within the study area. The 23rd Street Station is accessible by stairs on the east and west sides of 8th Avenue: the northbound track is accessible by stairs on the northeast and southeast corners of 23rd Street and the northeast and southeast corner of 25th Street; the southbound track is accessible by stairs on the northwest and southwest corners of 23rd Street and the northwest and southwest corner of 25th Street. Bus service in the study area consists of the M20 which runs northbound along 8th Avenue, and the M11 which runs southbound along 9th Avenue. There are no bus stops in the vicinity of the work area and West 28th Street does not serve any MTA C&D local bus routes.

MTA provides Access-A-Ride Paratransit Service throughout the five boroughs and maintains an Access-A-Ride stop on the south curb of West 28th Street midblock between 8th and 9th Avenues.

There are existing bike lanes operating northbound along the west curb of 8th Avenue and southbound along the east curb of 9th Avenue.

2.13.5 Parking

On-street parking surveys were conducted on two representative midweek days to determine the number of spaces within an acceptable ¼ -mile walking distance of the proposed substation site. Two surveys were conducted in 2018: one when parking restrictions are in effect on Tuesday mornings between 11:30 and 1 PM; and the other when most regulations are not in effect. Based on the surveys, there are approximately 519 legal on-street parking spaces within a reasonable walking distance of the Project Site. On the most restrictive regulation days, the number of available on-street parking spaces is reduced to 247 (**Table 2.8, "2018 Existing Parking Conditions"**). The demand for on-street parking matches the supply as no spaces were available on the regulation day and two spaces were available on the day without parking regulations in effect. The parking regulations along West 28th Street between 8th and 9th avenues are No Parking Monday and Thursdays between 11:00 AM and 12:30 PM along the north curb and No Parking Tuesdays and Fridays between 11:00 AM and 12:30 PM along the south curb.

Table 2.8: 2018 Existing Parking Conditions

Parking Parameter	w/Regs	w/o Regs
Parking-Space Supply	247	519
Demand (Occupancy Rate)	247 (100%)	517 (100%)
Spaces Available (Rate)	0 (0%)	2 (0%)

2.13.6 Pedestrians

Two-way pedestrian volumes on the north and south sidewalks of West 28th Street ranged between 330 and 360 persons during the weekday AM, MD, and PM peak hours. Pedestrian volumes were higher on the south sidewalk of West 28th Street, averaging 210 persons per hour, with the highest pedestrian volumes occurring during the 1-2 PM midday period.

At the intersection of 8th Avenue and 28th Street, pedestrian volumes on the east and west crosswalks were higher than the north and south crosswalks during the weekday peak hours as follows:

- North Crosswalk: 190 (AM), 220 (MD), 240 (PM)
- East Crosswalk: 860 (AM), 840 (MD), 1,160 (PM)
- South Crosswalk: 250 (AM), 250 (MD), 350 (PM)
- West Crosswalk: 570 (AM), 590 (MD), 810 (PM)

A 7- to 10-second leading pedestrian interval is given to pedestrians using the north crosswalk to provide these pedestrians with protected time to cross the 8th Avenue without conflicts from turning vehicles. Pedestrian movements operate at LOS C conditions or better for all three analysis periods for the crosswalks at 8th Avenue/28th Street and for the north and south 28th Street sidewalks west of 8th Avenue (see **Table 2.9, "2018 Existing Pedestrian Conditions")**.

Table 2.9: 2018 Existing Pedestrian Conditions

Intersection and Element	AM Peak		MD Peak		PM Peak	
	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS
8th Avenue & West 28th Street						
Northwest corner	84	A	79	A	71	A
Northeast corner	75	A	96	A	74	A
Southwest corner	98	A	82	A	61	A
Southeast corner	177	A	209	A	141	A
North crosswalk	74	A	82	A	82	A
South crosswalk	115	A	115	A	66	A
East crosswalk	37	C	46	B	34	C
West crosswalk	79	A	67	A	59	B
West 28th Street between 8th Avenue & 9th Avenue						
North sidewalk	445	A	405	A	330	A
South sidewalk	318	A	274	A	187	A

Note: Average Space is based on the assumption that pedestrians distribute themselves uniformly throughout the effective crosswalk and corner space. LOS designations are based on average pedestrian space expressed as square feet per pedestrian (sf/ped).

2.14 AIR QUALITY

2.14.1 Ambient Air Quality Standards

Under the Clean Air Act, the United States Environmental Protection Agency ("USEPA") has established National Ambient Air Quality Standards ("NAAQS") for six criteria pollutants: carbon monoxide ("CO"), nitrogen dioxide ("NO_2"), ozone ("O_3"), particulate matter ("PM"), sulfur dioxide ("SO_2"), and lead ("Pb"). Primary standards are designed to establish limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The NAAQS for all of the criteria pollutants are listed in **Table 2.10, "National Ambient Air Quality Standards."**

Table 2.10: National Ambient Air Quality Standards

Pollutant	Primary Standard		Secondary Standard		Form
	ppm	µg/m³	ppm	µg/m³	
Carbon Monoxide (CO)					
Eight-Hour Average	9	10,000	None		Not to be exceeded more than once per year
One-Hour Average	35	40,000			
Lead					
Rolling Three-Month Average	NA	0.15	NA	0.15	Not to be exceeded
Nitrogen Dioxide (NO_2)					
One-Hour Average	0.100	188	None		98th percentile of 1-hour daily maximum concentrations, averaged over three years
Annual Average	0.053	100	0.053	100	Annual Mean
Ozone (O_3)					
Eight-Hour Average	0.070	140	0.070	140	Annual fourth-highest daily maximum 8-hour concentration, averaged over three years
Respirable Particulate Matter (PM_{10})					
24-Hour Average	NA	150	NA	150	Not to be exceeded more than once per year on average over three years
Fine Respirable Particulate Matter ($PM_{2.5}$)					
Annual Mean	NA	12	NA	15	Annual mean, averaged over three years
24-Hour Average	NA	35	NA	35	98th percentile, averaged over three years
Sulfur Dioxide (SO_2)					
One-Hour Average	0.075	196	NA	NA	99th percentile of 1-hour daily maximum concentrations, averaged over three years
Three-Hour Average	NA	NA	0.5	1,300	Not to be exceeded more than once per year

Notes:
ppm – parts per million (unit of measure for gases only)
µg/m³ – micrograms per cubic meter (unit of measure for gases and particles, including lead)
NA – not applicable
All annual periods refer to calendar year.
Approximately equivalent concentrations in µg/m³ are presented.

Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards and https://www.epa.gov/criteria-air-pollutants/naaqs-table

2.14.2 Criteria Pollutants

Carbon Monoxide

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. CO concentrations can diminish rapidly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations are analyzed on a local (microscale) basis.

Ozone Precursors (Nitrogen Oxides and VOCs)

NO_x is of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow and occur as the pollutants are transported downwind, elevated ozone levels are often found many miles from the sources of the precursor pollutants. Therefore, ozone precursors are examined at the regional level, as opposed to the localized level considered for other criteria pollutants such as CO and PM.

Nitrogen Dioxide

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a Clean Air Act criteria pollutant. NO_2 is mostly formed from the transformation of NO in the atmosphere and is of concern downwind from large stationary sources.

Lead

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the Clean Air Act.

Respirable Particulate Matter —PM_{10} and $PM_{2.5}$

Particulate matter ("PM") is emitted into the atmosphere from a variety of sources: industrial facilities, power plants, construction activity, concrete batching plants, waste transfer stations, etc. The primary respirable particulates of concern are: (i) particles with an aerodynamic diameter of less than or equal to 2.5 micrometers (µm) (referred to as $PM_{2.5}$); and (ii) particles with an aerodynamic diameter of less than or equal to 10 µm (referred to as PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ is extremely persistent in the atmosphere and has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles.

All gasoline-powered and diesel-powered mobile source vehicles, especially heavy trucks and buses operating on diesel fuel, emit respirable particulates, most of which is $PM_{2.5}$. Consequently, levels of respirable particulates may be locally elevated near roadways with high volumes of gasoline and diesel-powered vehicles. Vehicular traffic may also contribute to PM emissions through brake and tire wear and by disturbing dust on roadways.

Sulfur Dioxide

Sulfur dioxide ("SO_2") emissions are associated primarily with the combustion of oil and coal, both sulfur-containing fuels. Due to federal rules restricting the sulfur content in diesel fuel for on-road vehicles, no substantial quantities are emitted from vehicular sources or construction equipment.

2.14.3 Monitored Ambient Air Quality

NYSDEC operates a network of monitoring stations throughout New York City to measure ambient air quality with the results published on an annual basis. The most recent NYSDEC air-monitoring databases identify existing air quality levels for the study area based on data from the monitoring stations nearest the Project Site. **Table 2.11, "Representative Monitored Ambient Air Quality Data (2018-2020),"** shows background air quality levels for the study area for those pollutants that are relevant to the analysis of construction air quality impacts. Selected locations represent available background sites nearest to the study area.

Table 2.11: Representative Monitored Ambient Air Quality Data (2018-2020)

Pollutant	Site Name	Site	Site Address	Units	Averaging Period	Concentration	NAAQS
CO	CCNY	36-005-0110	City College of New York	ppm	One-hour	2.0	9
					Eight-hour	1.5	35
PM_{10}	Division Street	36-061-0134	40 Division Street	µg/m³	24-hour	24	150
$PM_{2.5}$	Division Street	36-061-0134	40 Division Street	µg/m³	Annual	9.1	12
					24-hour	19.2	35
NO_2	IS 52	36-005-0110	School IS 52, 681 Kelly Street	µg/m³	Annual	18.3	53

Source: NYSDEC New York State Ambient Air Quality Report for 2020, http://www.dec.ny.gov/docs/air_pdf/2020airqualreport.pdf

2.14.4 Attainment Status and State Implementation Plans

The Clean Air Act, as amended in 1990, defines non-attainment areas ("NAA") as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan ("SIP"), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the Clean Air Act, followed by a plan for maintaining attainment status once the area is in attainment. **Table 2.12, "NAAQS Attainment Status of New York County,"** summarizes the attainment status of Manhattan (New York County) for each of the criteria pollutants. Manhattan is currently a nonattainment area for the eight-hour ozone standard and maintenance area for CO and $PM_{2.5}$. For the remaining pollutants the county is considered to be in attainment or insufficient data is available to make a designation of attainment or nonattainment "unclassifiable."

Table 2.12: NAAQS Attainment Status of New York County

Pollutant	Current Status	Date Redesignated to Maintenance	Notes
Carbon Monoxide (CO)	Maintenance Area	05/20/2002	Second 10-year maintenance plan approved effective 5/30/2014
Lead	Attainment/Unclassifiable	NA	
Nitrogen Dioxide (NO_2)	Attainment/Unclassifiable	NA	
8-hr Ozone (O_3) Standard (2008)	Nonattainment Area	NA	
Respirable Particulate Matter (PM_{10})	Attainment Area	NA	Formerly nonattainment for the revoked annual PM_{10} standard. Current 24-hr PM_{10} NAAQS has never been exceeded.
Fine Respirable Particulate Matter ($PM_{2.5}$)	Maintenance Area	04/18/2014	
Sulfur Dioxide (SO_2)	Attainment/Unclassifiable	NA	

Source: EPA Greenbook https://www.epa.gov/green-book, United States Environmental Protection Agency; New York State Department of Environmental Conservation, 2015 79 FR 31045

2.15 NOISE AND VIBRATION

Noise in a community can come from man-made sources such as automobiles, trucks, buses, aircraft, and construction equipment as well as from industrial, commercial, transportation, and manufacturing facilities. **Table 2.13, "Common Noise Levels,"** lists typical activities, noise levels, and effects that they have on humans. Noise levels, which are measured in units called decibels ("dB"), relate the magnitude of the sound pressure to a standard reference value. Although the noise values of certain activities can approach 135 dB, sounds typically encountered in the environment are within the 40 to 120 dB range. Noise of any kind contains sound energy that occurs at several different frequencies. The frequency range of this sound energy depends on the nature of the individual noise activity or source. The way humans interpret noise is important because the human ear does not register the sound levels of all noise frequencies equally; humans automatically reduce the impression of high- and low-pitched sounds. Over the normal range of hearing, humans are most sensitive to sounds produced with frequencies in the range of 200 hertz to 10,000 hertz. To quantitatively replicate this response of the human ear to noise, the noise levels at different frequencies must be adjusted using a process referred to as A-weighting. Under this process, the resulting noise level commonly expressed as an A-weighted decibel ("dBA") will automatically compensate for the non-flat frequency response of human hearing.

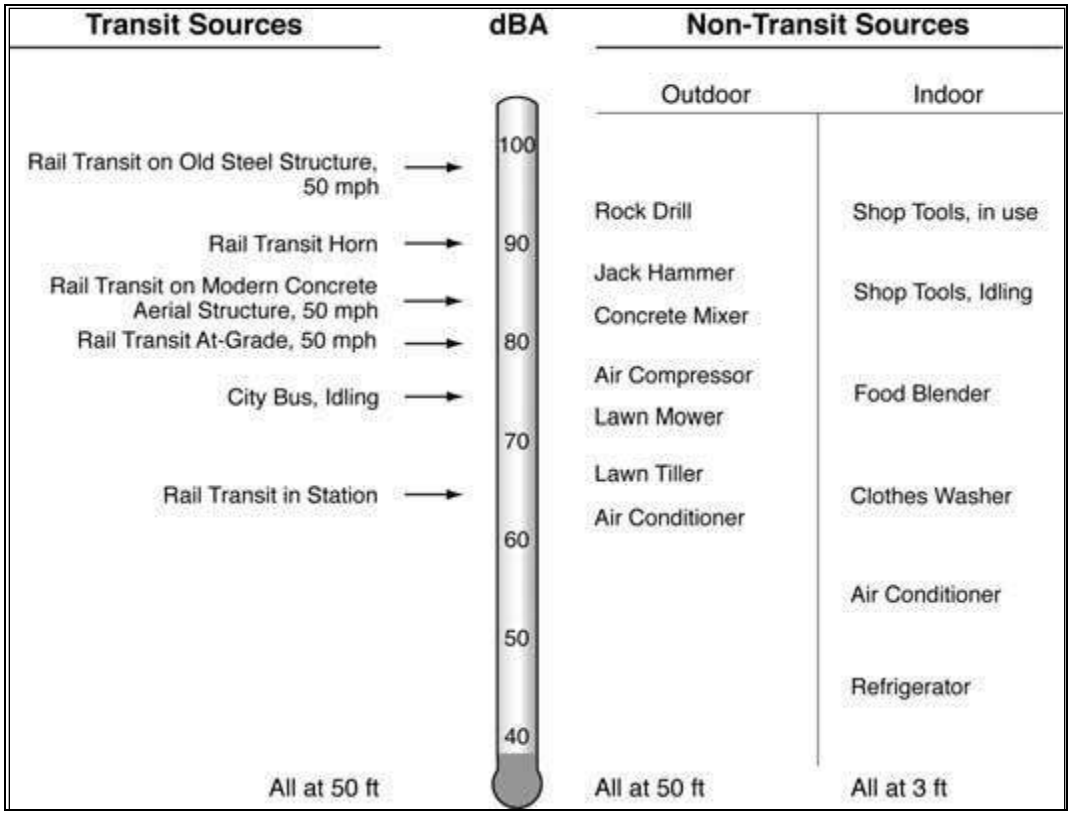
Noise levels from environmental and man-made activities also vary widely over time. Distinctive noise descriptors are used so that that these variations can be represented within a proper context. For example, the equivalent noise level, represented by the L_{eq} descriptor, characterizes a time-varying noise level produced over a random period of time, as a single number represented over a specified period of time. This represents the equivalent steady noise level, which, over a given period, contains the same energy as the time-varying noise during the same period.

A common time period used in environmental noise studies is one hour, represented as L_{eq} (h). This descriptor is used to express the results of noise monitoring, predictions, and impact assessments at sensitive receptors where sleep is not an issue. At sensitive receptors where sleep is essential, such as residences and hospitals, the descriptor most often used in noise analyses is the day-night average sound level or L_{dn}. The L_{dn} is defined as the cumulative noise exposure from all events occurring over a 24-hour period, but with a ten dB penalty imposed on noise occurring between 10PM to 7AM. This added penalty takes into consideration the fact that people tend to be more sensitive to noises during these late night and early morning hours. Allowable construction hours in NYC are limited to 7AM to 6PM, and the L_{eq} descriptor is used as it would be most relevant in describing the study area's noise environment.

Because changes in the decibel scale are represented logarithmically, increases or decreases in the decibel levels of a noise source are often misunderstood. The following general relationships are helpful in understanding the decibel scale with respect to noise:

- An increase of one dBA cannot be perceived by the human ear.
- A three dBA increase is normally the smallest change in sound level perceptible to the human ear.
- A ten dBA increase in noise level corresponds to a tenfold increase in noise energy; however, a listener would only judge a ten dBA increase as being twice as loud.
- A 20 dBA increase would result in a dramatic change in how a listener would perceive the sound.

Table 2.13: Common Noise Levels



Source: FTA, Manual for Transit Noise and Vibration Impact Assessment, September 2018.

2.15.1 Existing Noise Levels

Outdoor A-weighted sound levels were used to measure and analyze the noise effects at sensitive noise receptor locations, because dBA correlates well with the human perception of noise. In this report, noise receptors are defined as locations where human activity could be affected by excessive noise levels. The noise descriptor selected for this analysis was the 1-hour equivalent continuous noise level (L_{eq} (1h) in dBA.

Existing noise levels were measured on Tuesday October 12, 2021 on the north sidewalk of West 28th Street between the construction site and Penn South Building 9 adjacent to the construction site. As **Figure 2.12, "Noise Monitoring Location,"** shows, the monitoring location was selected within the study area to represent the existing conditions near the proposed substation. This location is representative of the typical land use in the area. Noise levels were measured for at least 20 minutes during the AM, midday, and PM periods.

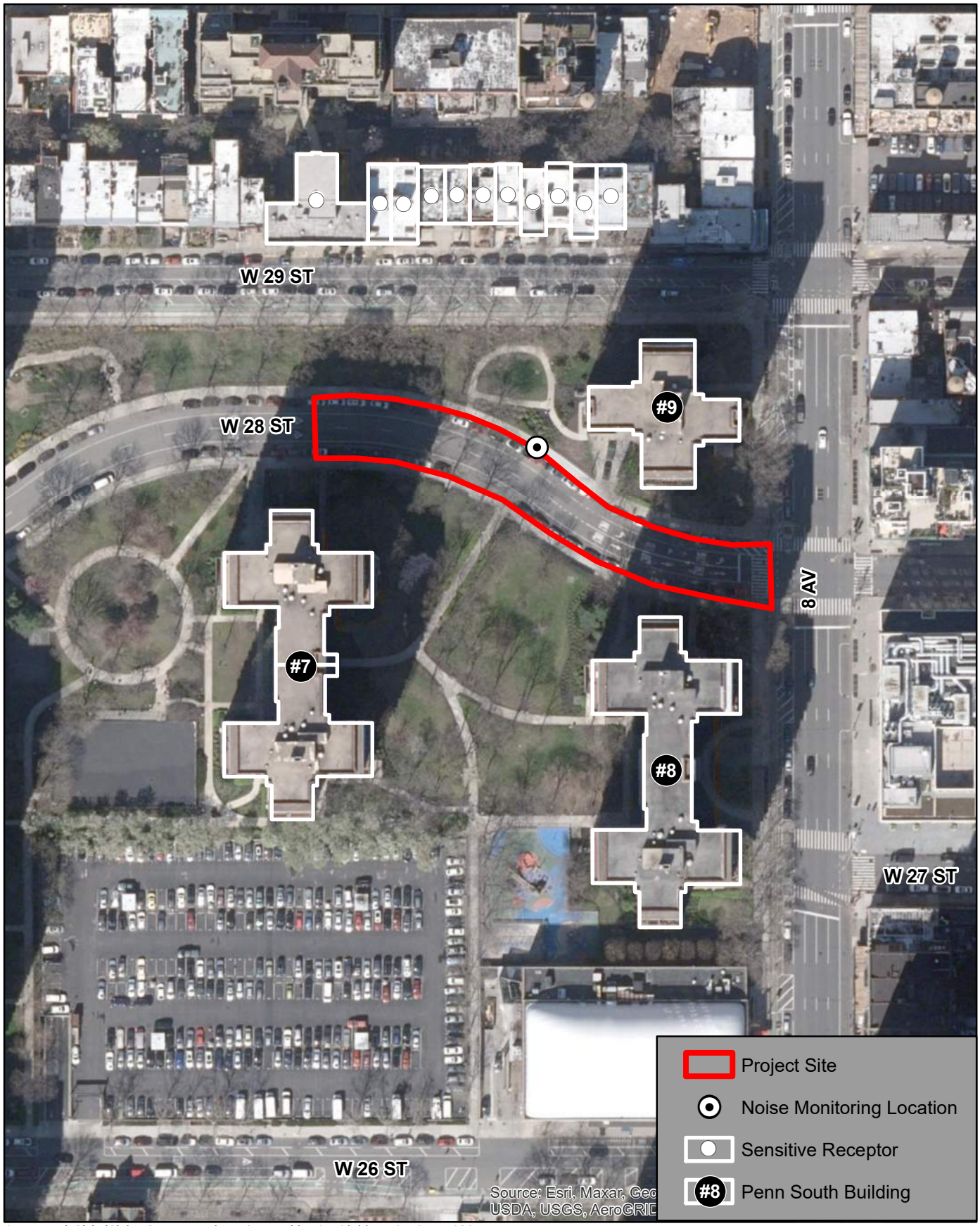
Noise measurements were taken with a sound level meter meeting ANSI S1.4-1983 Type I Standards and in accordance with FHWA's publication *Measurement of Highway-Related Noise*. A windscreen was placed over the microphones for all measurements. The meter was properly calibrated prior to each measurement using a Larson Davis Type 200 calibrator. There were no significant variances between the

beginning and ending calibration measurements. All measurements were taken during periods of dry pavement and acceptable wind speeds of less than 12 mph.

Table 2.14, "Existing Ambient Noise Levels," presents the results of baseline noise measurements. Existing noise levels ranged from 61.8 to 64.6 dBA L_{eq}, with the highest noise level occurring during the MD peak period. A steady background noise exists because of constant traffic on nearby 8th Avenue and on West 28th Street.

Table 2.14: Existing Ambient Noise Levels

Time Period	AM Measured L_{eq} (dBA)	Midday Measured L_{eq} (dBA)	PM Measured L_{eq} (dBA)
Noise Levels	63.9	64.6	61.8



Source: Esri, GigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; New York City Department of City Planning MapPLUTO 2022; STV Incorporated, 2022.

0 50 100 200 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.12

NOISE MONITORING LOCATION

MTA Construction and Development

2.16 RESILIENCY

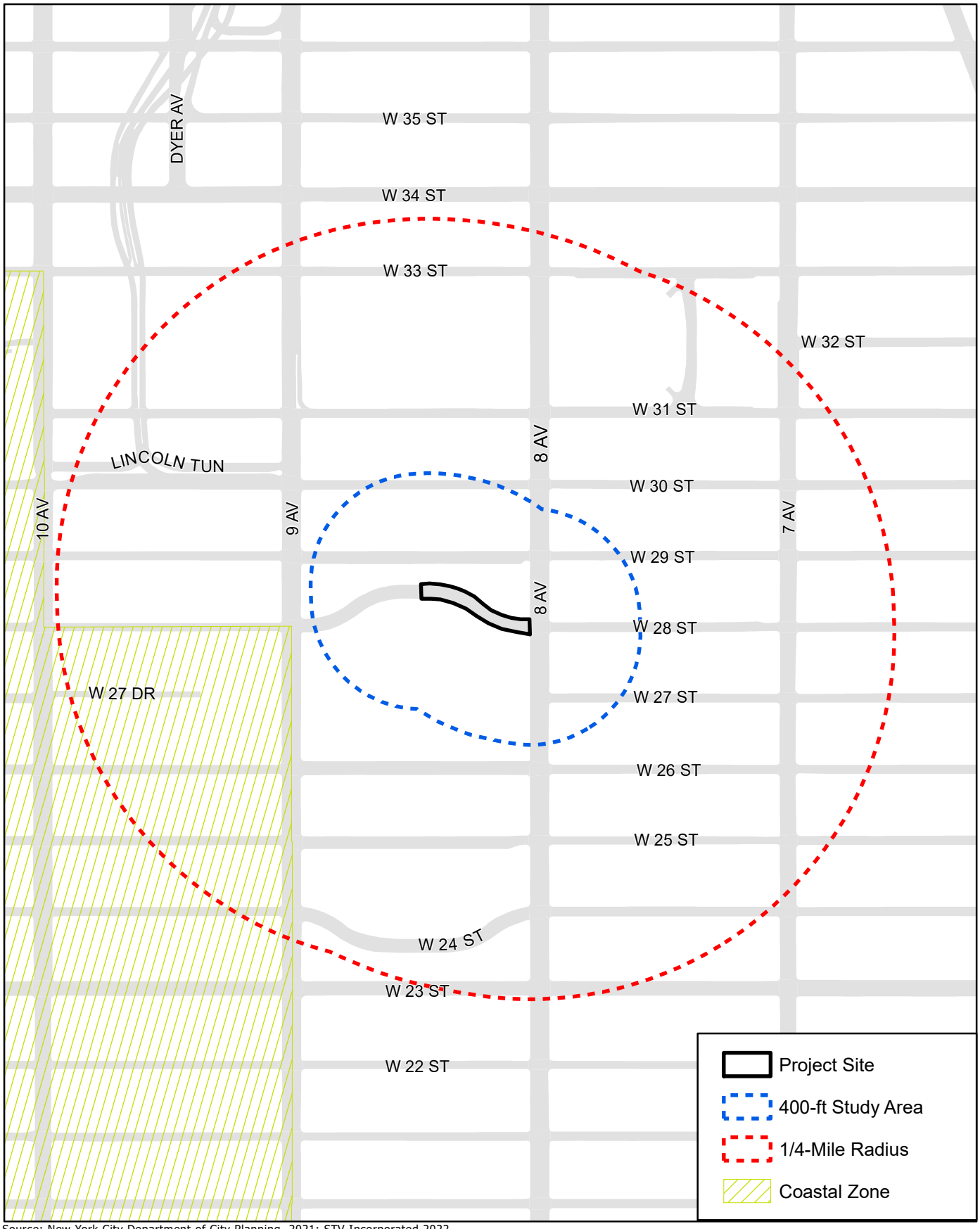
The Project Site is located outside of New York City's coastal zone, as depicted on **Figure 2.13, "Coastal Zone,"** as well as outside of the 1 percent annual exceedance probability ("AEP") ("100-year") and 0.2 percent AEP ("500-year") flood zones as defined by the FEMA Flood Insurance Rate Map.[3] The nearest 1 percent AEP flood zone is located approximately 1,000-feet to the north-northwest of the Project Site, and has a Base Flood Elevation ("BFE") of 10 feet NAVD 88.[4] According to MTA C&D contract drawings with on-site testing borings,[5] the Project Site grade varies from approximately 28 to 29 feet NAVD 88 and is located outside of the SLOSH Category 2 storm boundary. As such, the Project Site would exceed MTA C&D resiliency design guidelines (SLOSH Cat 2 + 3-ft) and coastal-flood resisting measures are not anticipated to be needed

The BFEs published by FEMA do not presently include the effects of sea level rise ("SLR"). SLR should be addressed based on the useful life of the project, and the latest New York City Panel on Climate Change ("NPCC") report. The NPCC report constitutes the combined efforts of NOAA, FEMA, ClimAID, and other stakeholders in New York State and City, and provides a range of projections for future 1 percent AEP flood zones based regional SLR scenarios for the 2020's, 2050's, 2080's and for 2100. As shown in both **Figure 2.14, "Projected 2020 Flood Zones,"** and **Figure 2.15, "Projected 2050 Flood Zones,"** based on the Project Site elevation and latest SLR projections, the Project Site has little vulnerability to coastal flooding due to SLR in the coming century.

The intensity and frequency of precipitation events are projected to increase with climate change. This increases the potential for stormwater management systems being overwhelmed and for more frequent flooding to occur due to rainfall. This may be exacerbated due to the Project Site's location, which is characterized by impervious surfaces on-site and surrounding areas. Based upon the useful life of the project and the design storm, climate-adjusted intensity-duration-frequency curves should be considered to inform drainage planning and stormwater management at the Project Site.[6] To better manage increasing rainfall intensity, the following design interventions can be chosen based on cost and useful life:

- Retaining, infiltrating, evaporating, or re-using the rainwater that falls on a site (e.g., using permeable paving materials, increased green spaces, cisterns).
- Installation of check valves and other backwater flow prevention where applicable.
- Installation of stormwater detention and storage (e.g., bioswales, green roofs, blue roofs, blue belts and other blue or green infrastructure; storage basins or tanks).
- Protection of areas below grade from flooding.
- Keeping catch basin grates clear.

[3] Preliminary Flood Insurance Rate Map Panel 182 of 457, 3604970201G, dated December 5, 2013
[4] North Atlantic Vertical Datum of 1988.
[5] Contract No. C-39013 Test Borings for Contract P-36317 New 34th Street Substation, 8th Avenue Line in the Borough of Manhattan, ADT13-10, NYCT, November 19. 2017.
[6] Regional projections can be based on 90th percentile of RCP 8.5 projections from the Northeast Regional Climate Center, as corrected with baseline data from NOAA Atlas 14.



Source: New York City Department of City Planning, 2021; STV Incorporated 2022.

N

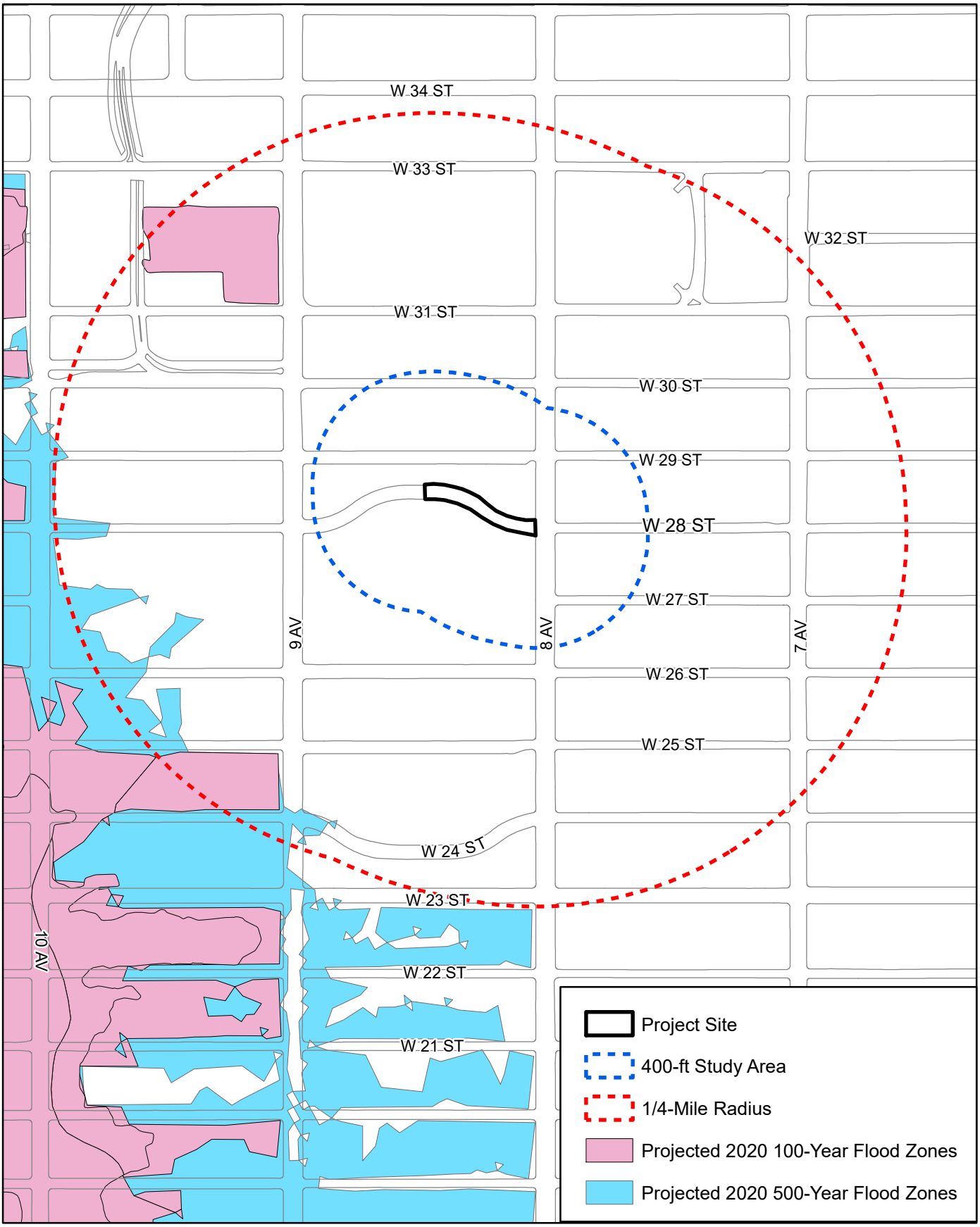
0 250 500 1,000 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.13

COASTAL ZONE

MTA New York City Transit



Source: New York City Panel on Climate Change, 2013; STV Incorporated, 2022.

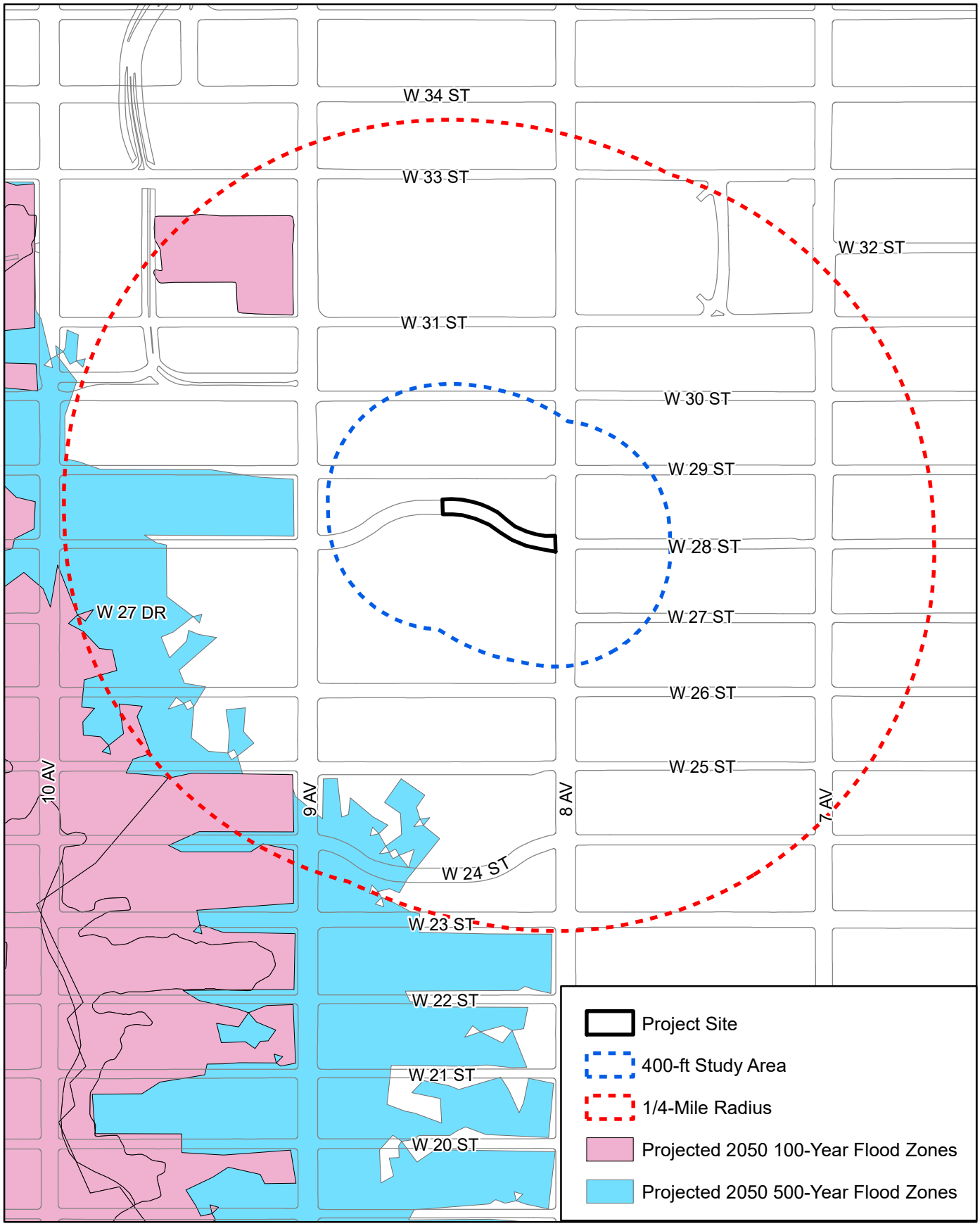
N

0 250 500 1,000 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.14

PROJECTED 2020 FLOOD ZONES



Source: New York City Panel on Climate Change, 2013; STV Incorporated, 2022.

N

0 250 500 1,000 Feet

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 2.15

PROJECTED 2050 FLOOD ZONES

Chapter 3: No-Action Conditions (Future Without the Proposed Project)

This chapter provides a discussion of qualitative and quantitative studies and effects that would be expected to result in the future without the Proposed Project. In the future without the Proposed Project, the proposed below-grade substation would not be constructed, and it is anticipated that the Project Site would generally resemble existing conditions in the 2025 analysis year. Therefore, the analysis of No-Action condition impacts (i.e., the analysis of the "no-build" conditions) will not include consideration of the following technical areas because there would be no potential for effect:

- Infrastructure and Utilities
- Safety and Security
- Energy Requirements and Potential for Conservation

3.1 LAND USE AND NEIGHBORHOOD CHARACTER

3.1.1 Land Use

In the future without the Proposed Project, no changes to the Project Site are anticipated to occur by the 2025 Build Year. The existing roadbed and sidewalk of West 28th Street, as well as the adjacent Penn South residential development, would remain in its current state as transportation and residential uses.

Based on a field survey conducted on August 25, 2021, and a review of the Zoning Application Portal ("ZAP") data, provided by the New York City Department of City Planning ("NYCDCP") and accessed via https://zap.planning.nyc.gov/projects on October 15, 2021, five development projects are anticipated to be undertaken within the vicinity of the Project Site, as detailed in **Table 3.1, "2025 No-Action Development Projects."** No rezonings, zoning text amendments, or other projects that could affect land use were identified within the vicinity of the Proposed Project.

Table 3.1: 2025 No-Action Development Projects

Address	Project Type	Project Description	Anticipated Year of Completion	Within 400-ft Radius
241 West 28th Street	Residential/mixed use development	• 479 residential units (214,000 sf) • 10,500 sf ground floor retail space	2023	Yes
215-225 West 28th Street	Residential/mixed use development	• 199 residential units • 20,000 sf ground floor retail space	2021	No
205 West 28th Street	Commercial development	• 102,903 sf office space • Ground floor retail space	2022	No
220 West 28th Street	Institutional development	• 10 story institutional building (academic building part of Fashion Institute of Technology Campus)	2023	No
335 Eighth Avenue	Residential/mixed use development	• 200 residential units • Ground floor retail space	Construction beginning in 2022	Yes

Source: New York City Department of City Planning (NYCDCP) Zoning Application Portal (ZAP), accessed October 15, 2021; Field Survey, August 25, 2021; STV Incorporated, 2021.

3.1.2 Zoning and Public Policy

No changes to zoning or public policy are expected to occur by the 2025 Build Year; zoning and public policy currently in effect for the Project Site and study area would remain in effect in 2025.

3.2 SOCIOECONOMIC CONDITIONS AND COMMUNITY DISRUPTION

If the Proposed Project is not constructed, no changes to the Project Site are expected to occur by the 2025 Build Year. As described in **Section 3.1, "Land Use and Neighborhood Character,"** five other developments are anticipated in the vicinity of the Project Site by the 2025 Build Year, however these are not anticipated to substantially alter the socioeconomic and demographic conditions. As such, socioeconomic conditions would generally resemble existing conditions in the future No-Action condition.

3.3 ENVIRONMENTAL JUSTICE

In the future without the Proposed Project, no changes to the Project Site are expected to occur by the 2025 Build Year. As described in **Section 3.1, "Land Use and Neighborhood Character,"** five development projects in the vicinity of the Project Site were identified, two of which – located at 241 West 28th Street, and 335 8th Avenue (within the Penn South complex) – would be within 400 feet of the Project Site. None of the development projects identified would be within the existing potential Environmental Justice Community to the north of the Project Site and would not be expected to substantially affect the demographic and economic make up of this densely populated section of lower Manhattan. Therefore, conditions related to environmental justice would generally resemble existing conditions in the future No-Action condition.

3.4 COMMUNITY FACILITIES

No significant change in the demand for community facilities and services, including police and fire protection, hospital and medical services, schools and daycare, and other community facilities are anticipated in the future without the Proposed Project.

3.5 OPEN SPACE AND PARKLAND

In the future without the Proposed Project, no significant change is expected regarding open space resources within the vicinity of the Proposed Project.

3.6 HISTORIC AND CULTURAL RESOURCES

In the future without the Proposed Project, there would be no new construction on the Project Site and no excavation or further disturbance of the Project Site. No potential historic or cultural resources would be affected.

There are no historic resources within close proximity to the Project Site that are slated for review or expected to be designated in the future without the project. Therefore, in the future without the project, there would be no change with regards to historic resources near the Project Site.

3.7 URBAN DESIGN AND VISUAL RESOURCES

In the future without the Proposed Project, no changes to the Project Site are expected to occur by the 2025 Build Year. The existing roadbed and sidewalks of West 28th Street, as well as the existing Penn South residential development, are anticipated to remain unchanged from existing conditions.

3.8 NATURAL RESOURCES

In the future without the Proposed Project, no changes to adjacent open space within Penn South are anticipated. Trees may be replaced along 28th Street; however, the type and quality of flora is not anticipated to substantially change. Habitats for two candidate threatened and endangered species, the Monarch Butterfly (*Danaus plexippus*) and the Yellow Bumble Bee (*Bombus fervidus*), are potentially located within the vicinity of the Project Site. The status of these species could change from candidate threatened and endangered species, to listed threatened and endangered species; however, the likelihood of this change cannot be determined at present. Further, the absence of the Proposed Project would not be expected to change conditions related to species habitat. Therefore, there would be no impacts related to natural resources in the future without the Proposed Project.

3.9 HAZARDOUS MATERIALS

In the future without the Proposed Project, no impacts related to hazardous materials are anticipated. . Hazardous materials and/or petroleum products can be located in soil and groundwater and generally are only encountered during construction activities. The likelihood of encountering these materials without construction activities taking place is low, therefore, there would be no impacts related to hazardous materials in the future without the Proposed Project.

3.10 TRAFFIC, TRANSIT, PARKING, AND PEDESTRIANS

The analysis of the future traffic conditions without the proposed West 28th Street Substation (i.e., the future No Build condition) serves as the baseline against which impacts of the project are compared. The future No Build analysis includes the traffic volume increases expected because of an overall growth in

background traffic through and within the study area, and major real-estate developments and roadway system changes scheduled to be occupied or implemented by the future 2025 Build Year.

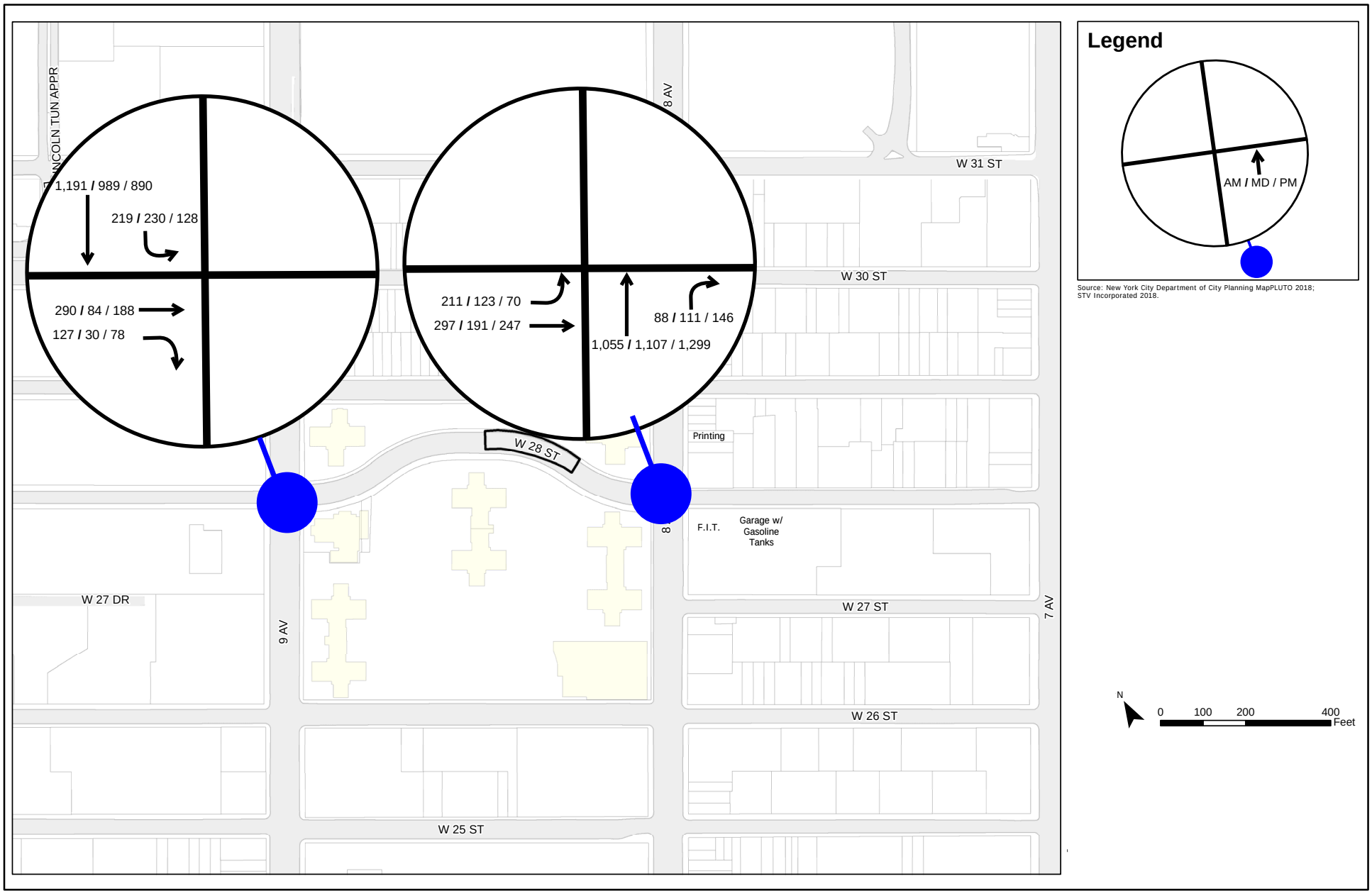
A background growth rate of one-quarter percent per year for five years and one-eighth percent for two years resulting in an overall growth of approximately two percent[7] by 2025 was assumed for this area of Manhattan, per CEQR standards. The 2025 Build year was conservatively selected for analysis as the last year of construction. Construction is anticipated to start in 2022 and require 39 months.

In addition to the background growth in the neighborhood, three development projects were included into the No Build analysis:

- A 248,000 square-foot mixed-use development, located at 241 West 28th Street, will provide 479 dwelling units and approximately 10,500 square-feet of ground floor retail space. Thirty percent of the units will be reserved for low- and middle-income households. It is expected to be completed in 2023.
- A 102,903 square-foot commercial office-use building, located at 205 West 28th Street, will consist of 12 commercial-use floors and ground level retail use. It is expected to be completed in 2022.
- A 110,000 square-foot new academic building for FIT, located at 220 West 28th Street, will consist of 10 floors and is expected to increase enrollment for the full-time and part-time undergraduate/postgraduate students. It is expected to be completed Spring of 2023.

The resulting 2025 No Build study area traffic volume network is provided on **Figure 3.1, "Traffic Volumes – No Build 2025."**

[7] The two percent background growth rate assumes an annual background growth of 0.25 percent for years one to five (2018–2023) and a growth of 0.125 percent for years six and seven (2024–2025), for the borough of Manhattan, per *CEQR Technical Manual* guidance.



Source: STV Incorporated, 2022.

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 3.1

Traffic Volumes - No Build 2025

Presented on **Table 3.2, "2025 No Build Traffic Conditions,"** are volume-to-capacity ratios, control delays (seconds/vehicle), and individual lane group and approach Levels of Service ("LOS") for year 2025 No Build weekday AM, MD, and PM peak hours. With the relatively minor increase in traffic projected on the study area roadways between 2018 and 2025, No Build LOS are generally similar to existing conditions with slight increases in delay. The analysis results in no substantial LOS deterioration in the No Build condition.

Table 3.2: 2025 No Build Traffic Conditions

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			MD Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized											
28th Street and 9th Avenue											
28th Street	EB	TR	0.86	44.8	D	0.27	22.6	C	0.64	31.0	C
9th Avenue	SB	L	0.71	44.8	D	0.71	44.4	D	0.44	34.9	C
		T	0.49	13.4	B	0.40	12.4	B	0.39	12.3	B
Overall Intersection		-		**24.2**	**C**		**18.9**	**B**		**18.6**	**B**
28th Street and 8th Avenue											
28th Street	EB	L	0.51	35.5	D	0.31	26.3	C	0.18	14.6	B
		T	0.54	31.1	C	0.33	18.4	B	0.48	14.8	B
8th Avenue	NB	TR	0.47	14.8	B	0.53	16.7	B	0.58	16.2	B
Overall Intersection		-		**20.4**	**C**		**17.6**	**B**		**15.9**	**B**

3.10.1 Transit

The number of transit riders in the study area were also assumed to increase by approximately 2 percent, in proportion to traffic volumes. No changes to existing bus or subway service are anticipated in the 2025 No Build analysis year.

3.10.2 Parking

Demand for parking was assumed to increase proportionally to the traffic growth in the study area by a background growth rate of one-quarter percent per year for five years and one-eighth percent for two years resulting in a two percent increase in demand by 2025. Parking space availability will decrease from the existing zero availability on days with and without regulations to a two and one percent shortfalls on days with regulations and days without regulations, respectively, in the future No Build 2025 condition (see **Table 3.3, "2025 No Build Parking Conditions"**).

Table 3.3: 2025 No Build Parking Conditions

Parking Parameter	w/Regs	w/o Regs
Parking-Space Supply	247	519
Demand (Occupancy Rate)	251 (102%)	525 (101%)
Spaces Available (Rate)	-4 (-2%)	-6 (-1%)

3.10.3 Pedestrians

The number of pedestrians in the study area were also assumed to increase due to an overall growth in background pedestrian traffic through and within the study area and major real-estate developments scheduled to be occupied or implemented by the future 2025 Build Year. Pedestrian movements would continue to operate at LOS C conditions or better for all three analysis periods for the crosswalks at 8th Avenue/28th Street and for the north and south 28th Street sidewalks west of 8th Avenue (see **Table 3.4, "2025 No Build Pedestrian Conditions"**).

Table 3.4: 2025 No Build Pedestrian Conditions

Intersection and Element	AM Peak		MD Peak		PM Peak	
	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS
8th Avenue & West 28th Street						
Northwest corner	64	A	60	A	59	B
Northeast corner	49	B	60	A	52	B
Southwest corner	71	A	61	A	47	B
Southeast corner	121	A	136	A	99	A
North crosswalk	41	B	45	B	50	B
South crosswalk	57	B	57	B	38	C
East crosswalk	26	C	32	C	26	C
West crosswalk	78	A	66	A	58	B
West 28th Street between 8th Avenue & 9th Avenue						
North sidewalk	277	A	257	A	239	A
South sidewalk	237	A	195	A	150	A

3.11 AIR QUALITY

The future condition without the Proposed Project (i.e., the future No-Action condition) would be similar to existing conditions. No new development is anticipated to occur within the Project Site. While traffic volumes may increase in the vicinity of sensitive receptors because of background growth in traffic, the increase would not be significant with respect to Air Quality. Accordingly, in the No-Action condition, Air Quality emissions in the area would be similar to existing conditions.

3.12 NOISE AND VIBRATION

The future condition without the proposed West 28th Street Substation (i.e., the future No-Action condition) would be similar to existing conditions. While traffic volumes may increase in the vicinity of sensitive receptors because of an overall growth in background traffic, the increase would not be significant with respect to noise. As a result, because vehicular traffic is the dominant noise source in the project area, no significant impacts are anticipated.

3.13 RESILIENCY

In the future without the Proposed Project, no changes to the Project Site are anticipated to occur by the 2025 Build Year. The existing roadbed and sidewalk of West 28th Street, as well as the adjacent Penn South residential development, would remain in its current state as transportation and residential uses. As projected by NPCC the 1 percent AEP will gradually extend further into Manhattan; however, based on the Project Site elevation and latest SLR projections, the Project Site has little vulnerability to coastal flooding due to SLR in the coming century. As such, no significant adverse impacts related to resiliency are anticipated in the future without the Proposed Project.

Chapter 4: With-Action Conditions

This chapter provides a discussion of qualitative and quantitative studies and effects that would be expected in the future with the Proposed Project. **Section 4.1, "Summary of Technical Area Analyses,"** outlines those technical areas for which detailed analyses of the potential for impact in the construction period and operational period were completed, and which technical areas have been "screened out" of detailed analysis for the construction period or operational period. The basis, methodology, and results of these detailed analyses are presented in **Section 4.2, "Construction Period Analyses,"** for the construction period, and **Section 4.3, "Operation Period Analyses,"** for the operational period (i.e., future With-Action conditions).

4.1 SUMMARY OF TECHNICAL AREA ANALYSES

Given that the Proposed Project would result in the construction and operation of a new below grade substation within the New York City Department of Transportation ("NYCDOT") right-of-way, its effects would generally be contained to the area beneath the Project Site. Further, upon construction completion, the Project Site would be restored to its existing conditions to the extent practicable. Therefore, the Proposed Project would not result in any effects to the following technical areas and, thus, they are not considered in the operation period analysis (i.e., the analysis of the "build" conditions following the completion of all construction activities):

- Land Use and Neighborhood Character
- Socioeconomic Conditions/Community Disruption
- Community Facilities
- Open Space/Parkland
- Historic and Cultural Resources
- Urban Design and Visual Resources
- Natural Resources
- Hazardous Materials
- Infrastructure and Utilities
- Safety and Security
- Energy Requirements and Potential for Conservation

Additionally, as currently contemplated, the design and construction of the Proposed Project would avoid or minimize adverse construction-period effects to the greatest extent feasible and practicable. However,

construction activities associated with the Proposed Project may result in noticeable and/or disruptive effects to surrounding uses and the public (e.g., pedestrians, drivers, residents, etc.). The anticipated construction-period effects are described in this chapter in terms of type of effect, duration, and magnitude; any significant adverse impacts that cannot be avoided are also described in this chapter, as well as planning measures and best practices that would be implemented by MTA C&D throughout construction. As construction activities are limited to the Project Site and much of the construction activities would occur underground, not all technical areas presented in **Chapter 2, "Existing Conditions,"** are addressed herein. Specifically, construction of the Proposed Project would not result in any direct or indirect effects to the following technical areas and, thus, they are not considered in the construction period analysis:

- Natural Resources
- Energy Requirements and Potential for Conservation
- Resiliency

4.2 CONSTRUCTION PERIOD ANALYSES

Construction of the proposed substation would require the relocation of utilities, excavation to build the below ground structures, installation of equipment, and restoration of the Project Site. Prior to the start of construction, the contractor would develop strategies for construction staging. Construction staging comprises the planning and management of equipment storage, site access, temporary truck parking, and equipment placement during construction. For the purposes of this analysis, construction staging is assumed to be limited to within the Project Site, while fabrication and storage of construction elements would occur at an off-site property (i.e., contractor's yard or construction workshop) outside of the study area.

The area under construction would be closed off by construction fencing. Construction work would be typically conducted between the hours of 7 AM and 3:30 PM due to noise ordinance restrictions. A Maintenance and Protection of Traffic ("MPT") plan would be developed by the contractor and approved by NYCDOT prior to street lane closures. The MPT plan would stipulate the date and duration of the lanes closure and would include traffic diversion routes and provisions for emergency vehicles.

The first stage of construction includes the installation of piles, potentially including secant piles, soldier piles with lagging, or sheet piles to construct the support of excavation ("SOE") structure. The Project Site would then be excavated, followed by the installation of the steel and structure foundation. The concrete would then be poured to form the floor, walls, and ceiling of the substation. Upon completion of this stage, the largest equipment would be delivered, and the hatch would be closed. The Project Site would then be restored, while underground activities related to the trackwork, cabling, and energizing of the substation occurs.

Construction of the Proposed Project is expected to be performed in eight phases. The expected activities and equipment for each phase are listed in **Table 4.1, "Overview of Construction Activities."**

Table 4.1: Overview of Construction Activities

Construction Phase I: Site Preparation	

Activities	• Install construction fence
	• Implement NYCDOT-approved Maintenance and Protection of Traffic ("MPT") Plan
	  ○ Close single lane of West 28th Street
	  ○ Reduce north and south sidewalks to 5' width and add barrier
	• Conduct test pits for utility identification
	• Advance soil borings for geotechnical information
	• Utility relocation and determine protection of existing utilities
	• Stage construction equipment

Equipment	• One drill rig • Backhoe • Roll-Off Truck and Roll-Off Dumpsters • Concrete truck • Support vehicles • Gas powered generators and air compressors, electrical and compressed air tools. • Miscellaneous small trucks or vans for deliveries
Construction Phase II: Pile Installation (with dewatering)	
Activities	• Advance 160 secant piles (drilled in) or approximately 48 soldier piles with 10-foot spacing • Dewater (as needed)
Equipment	• One drill rig/pile driver/day with support trucks • Two concrete mixer trucks for pile installation/day (4 sequenced) One 3,000- to 5,000-gallon tanker truck with pumps • Pumps for dewatering/water treatment (fractionation tank/oil-water separator/carbon filters) • One crane • Miscellaneous small trucks or vans for deliveries
Construction Phase III: Site Excavation (with dewatering)	
Activities	• Excavation up to 45 feet below ground surface • Dewatering (as needed)
Equipment	• Two backhoes • Cherry picker and skip pan • Crane to recover soils from deeper excavation, soil bags, and bulldozer • Excavation support trucks • Two dump trucks/day • Pumps for dewatering/water treatment (fractionation tank/oil-water separator/carbon filters) • Miscellaneous small trucks or vans for deliveries • Gas powered generators and air compressors, electrical and compressed air tools.

Construction Phase IV: Installation of the structure (foundation and steel)	
Activities	• Construct foundation • Erect steel structure
Equipment	• Crane and support trucks • Bulldozer • Boom truck • Flatbed tractor trailer • Five concrete trucks for each pour • Concrete pump truck • Miscellaneous small trucks or vans for deliveries
Construction Phase V: Concrete pours of structure	
Activities	• Pour concrete structure
Equipment	• Five concrete trucks for each pour • Concrete pump truck • Miscellaneous small trucks or vans for deliveries
Construction Phase VI: Installation of equipment	
Activity	• Deliver substation equipment via truck • Lower equipment (transformers, switch gear, etc.) through street level hatch • Install and connect equipment (below ground work)
Equipment	• Flatbed tractor trailer • Miscellaneous small trucks or vans for deliveries • Ten-ton crane • Backhoe and Excavation Support Trucks
Construction Phase VII: Site restoration (overlaps with installation of equipment)	
Activity	• Backfilling and Paving
Equipment	• Tractor trailer w flatbed • Concrete trucks • Compactor
Construction Phase VIII: Trackwork, Cabling, Testing, In-service	
Activity	• Trenching and backfilling in West 28th Street to install cables to connect with track power system
Equipment	• Small backhoe • Dump trucks to remove soil

Phase I

Phase I begins the process of site excavation by reconfiguring the sidewalk and vehicular traffic. A construction fence would be installed to isolate the construction area from the public, though access to businesses and residences in the vicinity of the Project Site would be maintained for the duration of construction.

Test pits would be excavated to locate utilities, and soil borings would be advanced to obtain geotechnical data. Utility relocation would be completed; short shutdowns of electric service to Penn South are anticipated during the construction activities. (This disruption of electric service will be discussed during public involvement activities [as detailed in **Chapter 7, "Agency and Public Involvement,"**] and appropriate notice will be given prior to the shutdowns.) It should be noted that Penn South has private utilities that connect the north and south complex approximately 30 feet east of the Project Site.

Equipment involved in this phase of construction is expected to include drill rigs and support trucks, a backhoe for excavation, roll-off trucks with roll-offs for excavated soil, and a concrete truck. Smaller equipment includes a gas-powered generator and air compressor, as well as various electric and compressed air tools. Miscellaneous small trucks or vans would be on-site for deliveries.

Phase II

Phase II involves one major activity: pile installation. Secant piles, soldier piles with lagging, or sheet piles walls will be installed. Solder piles with lagging and sheet piles will be driven in with a vibratory hammer or impact driver every 10-feet. For soldier piles, horizontal supports (lagging) would fill the gap, which would spread the load. For sheet pile installation, the piles are interlocked together during the installation. Secant pile installation requires the excavation of a trench around the perimeter of the substation, which would be filled with concrete and act as a drill guide for installation of the secant piles.

Approximately 160 secant piles and/or 48 soldier piles would be installed. Soldier or sheet piles would be driven with an impact or vibratory hammer, and wood lagging would be placed between soldier piles. Secant piles would be installed by drilling primary boreholes (and filling them with concrete), followed by drilling and filling the secondary boreholes, which are located between and connect the primary boreholes. The secondary boreholes would be lined/supported by a steel cage (rebar) to provide stabilization to the secant wall structure. Once the piles are installed, the sections located above ground would be cut to grade.

Equipment involved in this phase of construction would include drill rigs, including the larger drill rigs such as a BG 28 drill for the secant pile installation, support vehicles such as trailers, pile drivers, and concrete mixer trucks for the secant pile installation. For dewatering, a 3,000- to 5,000-gallon tanker truck with pumps, pump trucks, a fractionation tank and oil-water separator, and a crane would be used. In addition, miscellaneous small trucks or vans would be on-site for deliveries. Approximately 1,500 cubic yards of soil (approximately 125 truckloads) would be removed from the Project Site. Approximately 1,500 cubic yards of concrete would be required.

Phase III

Phase III includes excavation and would be the most intensive period of construction. Approximately 5,000 cubic yards of material would be removed, which equates to approximately 315 truckloads. Water that accumulates in the excavation would be removed, as needed. Equipment involved in this phase of construction would include backhoes (345 CAT), a cherry picker, and a skip pan for the excavation depth of approximately 40 feet. Beyond a depth of 40 feet, a crane and soil bag would be required. A D6 bulldozer, a CAT 318 excavator, and support trailers would also be used. An air compressor and various compressed air excavator tools, as well as two dump trucks per day, would be on-site during excavation activities. In addition, miscellaneous small trucks or vans would be on-site for deliveries. Pumps, a fractionation tank, oil-water separator, and carbon filters would be on-site for all dewatering and water treatment activities.

Phases IV and V

Once excavation is complete, the foundation and steel structure would be constructed (Phase IV), followed by concrete poured for the foundation, walls, and roof of the structure (Phase V). Equipment involved in these phases of construction include a crane and support trailers. Other vehicles include bulldozers, a boom truck to move steel beams, a flatbed tractor trailer for deliveries, concrete trucks, a concrete pump truck, and pumps. In addition, miscellaneous small trucks or vans would be on-site for deliveries. Phase V would require fewer vehicles than Phase IV.

Phase VI

Once the structure is in place, the equipment for the substation would be delivered and installed. Equipment involved in this phase of construction would include a flatbed tractor trailer with a ten-ton or larger crane. In addition, miscellaneous small trucks or vans would be on-site for deliveries. A backhoe and trucks for soil removal would be used for the trenches in 8th Avenue.

Trenching for duct runs to electrically connect the substation to the subway tracks would be completed in this phase. Equipment involved in this phase of construction is expected to include a backhoe for excavation, roll-off trucks with roll-offs for excavated soil, and a concrete truck. Smaller equipment includes a gas-powered generator and air compressor, as well as various electric and compressed air tools. Miscellaneous small trucks or vans would be on-site for deliveries.

Phase VII

Site restoration would be performed concurrent with equipment installation. The street would be repaved and the sidewalk re-concreted and scored. Equipment involved in this phase of construction would include a tractor trailer with a flatbed to deliver equipment, landscape trucks, concrete trucks, and a compactor.

Phase VIII

Underground work including trackwork and cabling would begin in Phase VI and would be completed in Phase VIII when cables are installed to connect the substation to the existing track power supply. Installation of the cables would require two parallel 4-foot by 4-foot trenches located approximately four feet apart in West 28th Street adjacent to the Project Site.

Construction of the Proposed Project is expected to begin in January 2022 with three months of mobilization, continuing for approximately 39 months and ending in Fall 2025. **Table 4.2, "Anticipated Durations of Construction Activities,"** summarizes the anticipated duration of each Phase.

Table 4.2: Anticipated Durations of Construction Activities

Construction Phase		Anticipated Dates of Activity
	Mobilization (Not Site Activities)	01/2022 - 04/2022
I	Site Preparation	04/2022 - 09/2022
II	Support of Excavation	09/2022 - 03/2023
III	Excavation	03/2023 - 06/2023
IV	Foundation/Steel	06/2023 - 10/2023
V	Concrete Pours of Structure	10/2023 - 02/2024
VI	Installation of Equipment	02/2024 - 05/2024
VII	Site Restoration	02/2024 - 05/2024
VIII	Trackwork, Cabling, Testing, In-Service	05/2024 - 12/2025

4.2.1 Land Use and Neighborhood Character

Construction of the Proposed Project would result in minor affects to character of the neighborhood for up to 39 months. While the on-site land use would be temporarily changed during construction, this would not represent a wholesale change to the established pattern of this urban neighborhood. Rather, certain construction period effects may be perceptible to the public in the adjacent residential areas and those with direct views of the Project Site or from within the streetscape areas surrounding the Project Site. However, any such effects (as described further in this section) would not result in notable detriment to the character of the neighborhood.

As viewed from the surrounding streetscape, the Project Site would be characterized by construction barriers/fences, laydown areas for equipment, and trucks hauling debris away or delivering construction material. At times, especially during the initial phases, noise generated by construction activities would be audible for area residences, workers, and pedestrians in the area.

Excavation in the roadbed for utility relocations would occur during normal working hours and would be covered with decking plates that would be secured in place during non-working hours.

Construction activities would occur within the roadbed of West 28th Street, and within the adjacent sidewalks. The structure would be located underground of the NYCDOT roadbed and, as a result, there would not be permanent effects outside of the NYCDOT right-of-way. The only visible change within the NYCDOT right-of-way would be the addition of hatches and grates in the streets and sidewalks, and the widening of the northern sidewalk. There would be no change to the roadway width or parking, or to existing land use as a result of the Proposed Project.

Therefore, the proposed construction would not result in significant adverse impacts related to land use and neighborhood character.

4.2.2 Socioeconomic Conditions and Community Disruption

As discussed in **Chapter 2, "Existing Conditions"** the Proposed Project would not introduce or otherwise directly affect the population. As described in **Chapter 2**, noise and vibration would temporarily affect

the surrounding businesses and residents. With the MPT in place, traffic and pedestrian safety and flow would be maintained throughout construction.

Therefore, beyond the management of construction noise and vibration (discussed later in this chapter), construction activities would not result in significant adverse impacts to socioeconomic conditions, nor would they result in community disruption.

4.2.3 Environmental Justice

As discussed in **Chapter 2, "Existing Conditions",** no environmental justice communities are located within the Project Site; however, one potential environmental justice community is located within the 400-foot radius study area. The Proposed Project would not affect the overall socioeconomic conditions of the surrounding neighborhoods as there would be no direct effects to land use or neighborhood character. There would be minor disruptions to the adjacent community and immediate vicinity during the construction period resulting from the reduction in width of or temporary closure of the sidewalks and closing of one travel lane on West 28th Street. If a minimum five-foot sidewalk width cannot be maintained within the construction zone, a temporary crosswalk and flagger will be provided to guide pedestrians across West 28th Street. In addition, there would be disruption from an increase of construction vehicles in the study area. These disruptions would be temporary in durations, and none would inhibit consistent, safe access to the surrounding residences and businesses during construction. The Proposed Project would not impact these communities directly, and would enhance service on the A/C/E subway service line between West 13th Street and West 53rd Street by providing more frequent and reliable transit service, which would benefit environmental justice communities in the surrounding neighborhood

Therefore, the Proposed Project would not result in adverse of disproportionate impacts to any identified environmental justice communities.

4.2.4 Community Facilities

The Project Site does not comprise a community facility, and there are no community facilities located near enough to be directly or indirectly affected during construction. Further, with the MPT in place, traffic and pedestrian safety and flow would be assured, and emergency services would be unaffected.

Therefore, beyond the management of temporary construction noise and vibration (discussed later in this chapter), the Proposed Project would not result in significant adverse impacts to community facilities.

4.2.5 Open Space and Parkland

Construction of the Proposed Project would not result in an effect on any of the open spaces and parks located within the study area. Access to the open spaces associated with Penn South will remain open.

On the north side of Penn South, a Tree Protection Plan will be developed for five of the trees located within Penn South, and tree protection fence will be installed around the trees, if feasible. Access to the

open spaces would not be directly affected by the Proposed Project; however, these trees will be assessed to determine what tree protection measure will be required during construction.

Through implementation of the management measures identified above, the Proposed Project would not result in significant adverse impacts to open space and parkland.

4.2.6 Historic and Cultural Resources

As noted in **Section 2.6, "Historic and Cultural Resources,"** there is a S/NR listed historic structure located within 125 feet of the Project Site (Penn South Building 7), and there is no historical period archaeological sensitivity for the Project Site. The New York City Building Code provides some measures of protection for all LPC properties against accidental damage from adjacent construction by requiring that all buildings, lots, and service facilities adjacent to foundation and earthwork areas be protected and supported. Additional protective measures apply to designated LPC Landmarks and S/NR-listed historic buildings located within 90 linear feet of a proposed construction site. For these structures, the New York City Department of Buildings' ("DOB") Technical Policy and Procedure Notice ("TPPN") #10/88 apply. TPPN #10/88 supplements the standard building protections afforded by the Building Code by requiring, among other things, a monitoring program to reduce the likelihood of construction damage to adjacent S/NR or NYCL resources (within 90 feet) and to detect at an early stage the beginnings of damage so that construction procedures can be changed. The S/NR-listed Bayard Rustin Apartment in Building 7b of Penn South is located approximately 90 feet from the construction zone. Vibration control measure include developing and implementing a vibration-monitoring program during highly disruptive construction activities, such as pile driving, to ensure that historic structures would not be damaged.

Any potential impacts to historic resources from vibration would be addressed through the formal consultation process and, if indicated, the development of a Cultural Resources Management Plan ("CRP") that could include construction monitoring discussed above. If indicated, the MTA C&D would enter into an MOU/MOA with the NYSHPO and consult with the LPC regarding potentially impacted culturally substantial sites to ensure that all potential impacts are identified and avoided or minimized to the greatest extent practicable.

Therefore, with vibration control measures implemented and monitored during construction, the Proposed Project would not result in significant adverse impacts to historic and cultural Resources.

4.2.7 Urban Design and Visual Resources

Construction of the Proposed Project would temporarily affect the visual character of the streetscape surrounding the Project Site during the construction activities. These activities would be temporary and would not represent a change to urban design. Further, as the Project Site would be restored to existing conditions (roadway and sidewalk) as the final phase of construction, there would be no permanent change to urban design. Specifically, there would be no change during construction, or as a result of construction, to the block form, street pattern, street hierarchy, buildings size, type, or use in the surrounding neighborhood, nor changes to the street wall.

Certain construction period effects may be perceptible to the public with direct views of the Project Site, but any such effects (as described further in this section) would not be substantial enough, or would not combine, to result in notable detriment to the visual character of the study area. As viewed from surrounding residences and the open areas adjacent to the Project Site, the view would be characterized by construction barriers/fence, laydown areas for equipment, and trucks hauling debris away or delivering construction material.

Therefore, the Proposed Project would not result in significant adverse impacts related to urban design.

4.2.8 Hazardous Materials

The findings of a Phase I ESA identified the potential presence of hazardous materials at the Project Site and in the study area. Recognized environmental conditions ("RECs") include the potential presence of historic fill material at the Project Site, and a fuel spill within the project vicinity. Additionally, portions of the Project Site were historically occupied by dry cleaners, a dry cleaning school and businesses that used hazardous chemicals. Undocumented releases from these facilities may have impacted soil and groundwater. (See **Appendix B, "Phase I ESA."**)

Construction activities associated with the Proposed Project have the potential to encounter hazardous materials in soil and groundwater. The health and safety of construction workers and surrounding community would be protected through implementation of a Health and Safety Plan, Soil Management Plan and Groundwater Management Plan. Once construction is complete and the Proposed Project is operational, pavements will be restored and there will be no potential for contact with hazardous materials in soil or groundwater.

Therefore, with measures in place to protect workers and the public from potential hazardous materials on the Project Site, the Proposed Project would not result in significant adverse impacts related to hazardous materials.

4.2.9 Infrastructure and Utilities

As described in **Chapter 2, "Existing Conditions,"** utilities in the study area include sewer, water, telecommunications, and electricity. Penn South has private utilities that connect the north and south complex approximately 30 feet east of the Project Site. The construction of the proposed substation would require temporary utility relocation with the Project Site and study area. As an overview, West 28th Street contains the following known utilities:

- An existing 48-inch diameter sanitary sewer line
- A 12-inch diameter water line constructed in 1993
- An existing 3-inch telecommunications duct
- Two Con Edison 4-inch electric ducts

Short shutdowns of electric service to Penn South are anticipated during the construction activities. This will be discussed during the Public Involvement activities (as discussed in **Chapter 7, "Agency and Public Involvement"**) and appropriate notice will be given prior to the shutdowns.

The Proposed Project would not introduce a new population for wastewater, sewer or sanitation services. The Proposed Project would require additional electrical services for operation of the substation and subway system but would not increase the demand for the local utility companies. All on-site utilities would be moved or protected during construction and excavation.

Therefore, construction of the Proposed Project would not result in significant adverse impacts to either infrastructure or utilities.

4.2.10 Safety and Security

MTA C&D complies with all applicable federal and state regulations. Further, MTA C&D has developed processes and procedures to ensure the safety and security of employees, transit riders, and the general public. These processes and procedures are incorporated into the System Safety Program Plan, which governs all MTA C&D facilities during construction and operations. MTA C&D staff and contractors are trained in all appropriate construction safety procedures under this plan. During construction, written Safe Work Plans would be developed by the contractors to identify potential hazards and safety measures that would be implemented to protect the health and safety of workers and the general public. During the operational phase of the Proposed Project, the substation would be secured, and access restricted to authorized MTA C&D personnel and contractors.

4.2.11 Traffic, Transit, Parking, and Pedestrians

This section presents the findings of the assessment of the potential impacts of the construction of the Proposed Project on traffic, transit, parking, and pedestrian operations. Following is a description of the relevant study areas, analysis methodologies, and affected environment for each transportation element.

STREET LANE AND SIDEWALK CLOSURES

Temporary vehicle lane and sidewalk closures are anticipated adjacent to the construction site, similar to other construction projects in New York City. At least one eastbound travel lane would be maintained on West 28th Street during all stages of construction; therefore, no rerouting of traffic is anticipated during construction. Truck movements would be spread throughout the day and would generally occur between 6 AM and 5 PM, depending on the stage of construction.

TRAFFIC

Construction Worker and Truck Trip Estimates

The average daily number of on-site construction worker and truck trips were forecasted for the substation construction by stage. The number of workers and trucks would peak during the Concrete

Pour construction stage with an estimated 30 workers and seven trucks per day (see **Table 4.3, "Construction Worker and Truck Trip Estimate"**). These represent peak days of work, and many days during the construction period would require fewer construction workers and trucks on-site.

Table 4.3: Construction Worker and Truck Trip Estimate

Construction Stage	Average Daily Number of	
	Truck Trips	Workers
Mobilization and Site Preparation	2 concrete mixers and 2 small trucks	30
Excavation	2 dump trucks and 2 small trucks	30
Concrete Pours	5 concrete mixers and 2 small trucks	30
Installation of Equipment	n.a.	30
Site Restoration	5 concrete mixers and 2 small trucks	10

Source: MTA C&D

Modal split and vehicle occupancy rates for construction workers were based on *2011-2015 American Community Survey* journey-to-work data for New York City. It is anticipated that approximately 25 percent of construction workers are expected to travel by personal automobile at an average occupancy rate of approximately 1.11 persons per vehicle. A total of 60 percent would use public transportation in their commute to and from the construction site. The remaining 15 percent walk to work.

Table 4.4, "Peak Incremental Construction Vehicle Trip Projections (in PCEs)," lists the forecast of hourly construction worker auto and construction truck trips during the peak construction period. In accordance with City laws and regulations, construction work at the Project Site would generally begin at 7 AM on weekdays, with workers arriving to prepare work areas between 6 and 7 AM. Construction work activities would typically finish around 3:30 PM and depart the Project Site thereafter. The temporal distribution for employee vehicle trips was based on typical work shift allocations and conventional arrival/departure patterns for construction workers, which indicate that 80 percent of the construction workers would arrive during the AM construction peak hour and depart during the PM construction peak hour.

To avoid congestion and ensure that materials are on-site for the start of each shift, construction truck deliveries would often peak during the hour before the regular day shift, overlapping with construction worker arrival traffic. Each truck delivery was assumed to result in two truck trips during the same hour (one inbound, one outbound). For analysis purposes, truck trips were converted into Passenger Car Equivalents ("PCEs") based on one truck being equivalent to an average of two PCEs.

Materials deliveries would approach the Project Site along designated NYCDOT truck routes such as 8th and 9th Avenues. Closer to the Project Site, trucks would use local streets, such as West 28th Street. It is expected that there would be adequate storage available on the Project Site for the storage of construction materials, and that the public thoroughfares adjacent to the Project Site would not be closed or impeded for significant periods of time for construction.

Table 4.4: Peak Incremental Construction Vehicle Trip Projections (in PCEs)

Hour	Auto Trips					Truck Trips					Total Vehicle Trips		
	In		Out		Total	In		Out		Total	In	Out	Total
	%	#	%	#		%	#	%	#				
6-7 AM	80	6	0	0	6	30	4	30	4	8	10	4	14
7-8 AM	20	1	0	0	1	20	3	20	3	6	4	3	7
8-9 AM	0	0	0	0	0	15	2	15	2	4	2	2	4
9-10 AM	0	0	0	0	0	7	1	7	1	2	1	1	2
10-11 AM	0	0	0	0	0	7	1	7	1	2	1	1	2
11-12 PM	0	0	0	0	0	7	1	7	1	2	1	1	2
12-1 PM	0	0	0	0	0	7	1	7	1	2	1	1	2
1-2 PM	0	0	0	0	0	7	1	7	1	2	1	1	2
2-3 PM	0	0	5	0	0	0	0	0	0	0	0	0	0
3-4 PM	0	0	80	6	6	0	0	0	0	0	0	6	6
4-5 PM	0	0	15	1	1	0	0	0	0	0	0	1	1
Total	**100**	**7**	**100**	**7**	**14**	**100**	**14**	**100**	**14**	**28**	**21**	**21**	**42**

Source: STV Incorporated, 2021.

The peak hour for construction vehicle activity would be 6 to 7 AM and would consist of a total of 14 vehicle trips (in PCEs), including ten inbound trips and four outbound trips.

Overall, the construction peak hour would generate fewer than 50 vehicle trips (presented in PCEs); therefore, no detailed traffic analysis for construction activities is needed, as per the *CEQR Technical Manual*.

Intersection Impact Criteria

The identification of significant, adverse traffic impacts at analyzed intersections is based on criteria presented in the *CEQR Technical Manual*. If a lane group in the Build condition is within LOS A, B or C, or D (i.e., average control delay less than or equal to 55.0 seconds/vehicle for signalized intersections), the impact is not considered significant. For a lane group that would operate at LOS E in the Build condition, a projected Build increase in delay of 5.0 or more seconds compared to the No Build condition is considered significant. For a lane group that would operate at LOS F in the Build condition, a projected Build increase in delay of 4.0 or more seconds compared to the No Build condition is considered significant.

Generally, traffic impacts may result from either construction of a project or its subsequent operation. For construction-related impact analysis, the analysis considers changes that would result from the addition of construction vehicle traffic to the roadway network and associated construction activities (e.g., lane closures, street closures, detours).

- During Maintenance and Protection of Traffic ("MPT") construction Stages IV and V, eastbound traffic on West 28th Street would be reduced from two travel lanes to one lane (see **Figure 4.1, "Maintenance and Protection of Traffic Plan – Stage IV"**) except between the weekday hours of 7 to 10 AM when two eastbound travel lanes will be provided. MPT Stages IV and V are anticipated to span approximately one month each. During these Stages, traffic volumes would be the same as the No Build Traffic Networks (see **Figure 3.1, "Traffic Volumes – No Build 2025"**).

There would not be an increase in traffic volumes at any intersections in the project study area; however, there would be a decrease in vehicle capacity on West 28th Street between 8th and 9th Avenues. The work zone traffic control at West 28th Street would result in an increased traffic delay at the intersection of West 28th Street and 8th Avenue (**see Table 4.5, "2025 Construction Phase Traffic Conditions"**); however, all traffic movement would continue to operate at an acceptable LOS D condition or better, resulting in no significant adverse traffic impacts.

Table 4.5: 2025 Construction Phase Traffic Conditions

INTERSECTION & APPROACH		Mvt.	AM Peak Hour			MD Peak Hour			PM Peak Hour		
			V/C	Control Delay	LOS	V/C	Control Delay	LOS	V/C	Control Delay	LOS
Signalized											
28th Street and 9th Avenue											
28th Street	EB	TR	0.86	44.8	D	0.27	22.6	C	0.64	31.0	C
9th Avenue	SB	L	0.71	44.8	D	0.71	44.4	D	0.44	34.9	C
		T	0.49	13.4	B	0.40	12.4	B	0.39	12.3	B
Overall Intersection		-		**24.2**	**C**		**18.9**	**B**		**18.6**	**B**
28th Street and 8th Avenue											
28th Street	EB	L	0.53	35.9	D	-	-	-	-	-	-
		T/LT	0.56	31.5	C	0.55	24.6	C	0.62	20.8	C
8th Avenue	NB	TR	0.47	14.8	B	0.53	16.7	B	0.59	16.3	B
Overall Intersection		-		**20.5**	**C**		**18.3**	**B**		**17.0**	**B**

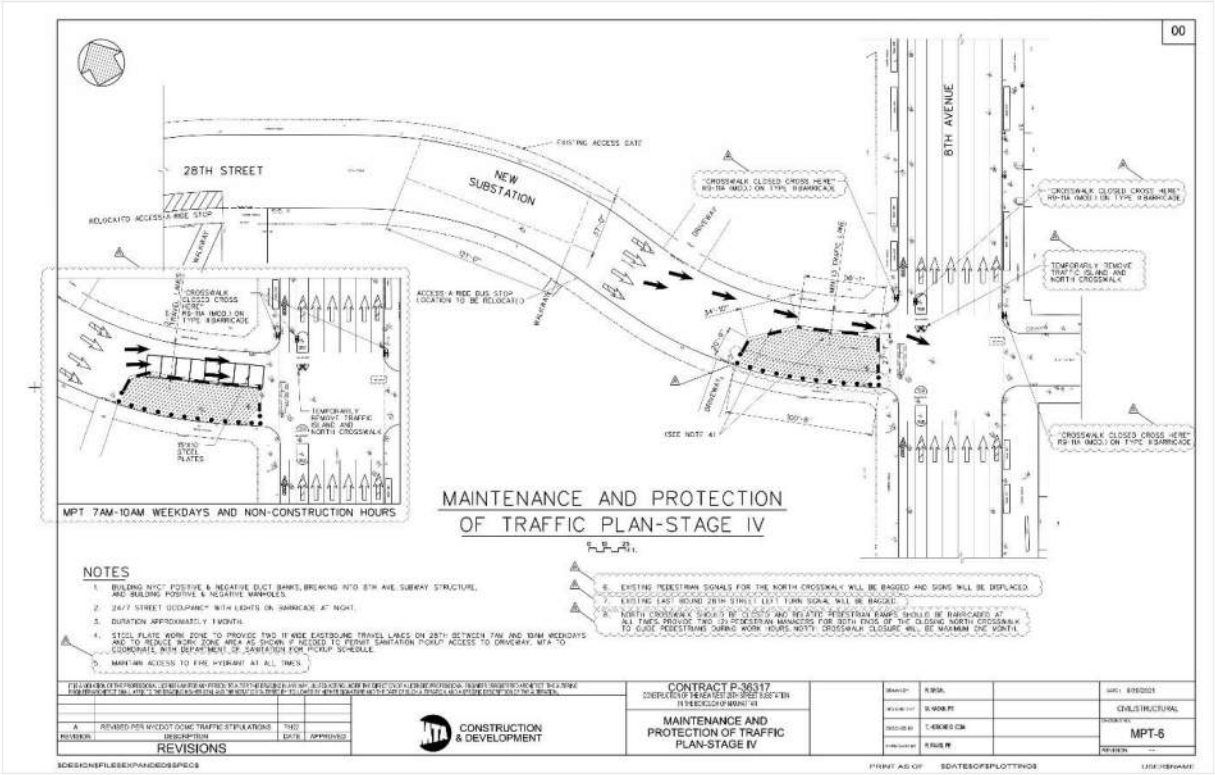


Figure 4.1: Maintenance and Protection of Traffic Plan – Stage IV

TRANSIT

The proposed West 28th Street Substation construction is not anticipated to result in effects to existing NYCT subway and/or bus service.

Less than 200 incremental peak hour transit trips would be generated by construction workers during the substation construction; therefore, the construction phase is unlikely to create a significant transit impact.

The existing Access-a-Ride on West 28th Street will be relocated within approximately 200 feet of its original location during specific construction phases.

PARKING

As per *CEQR Technical Manual* guidelines, no detailed parking analysis is required for construction activities; therefore, the following discussion will disclose the number of on-street parking spaces affected by construction operations.

Up to 32 existing parking spaces on West 28th Street will be temporarily unavailable during specific construction phases. The shortfall in available parking would increase to two percent on regulation days and to seven percent on non-regulation days (see **Table 4.6, "2025 Construction Phase Parking**

Conditions"), but would not be considered a significant parking shortfall due to the magnitude of available alternative modes of transportation. The project is located within CEQR Parking Zone 1, which includes the borough of Manhattan south of 110th Street.

Table 4.6: 2025 Construction Phase Parking Conditions

Parking Parameter	w/Regs	w/o Regs
Parking-Space Supply	247	519
Demand (Occupancy Rate)	251 (102%)	525 (101%)
Spaces Available (Rate)	-4 (-2%)	-38 (-7%)

PEDESTRIANS

The sidewalks along West 28th Street may be narrowed to a five-foot width during specific construction phases or closed temporarily. Temporary crosswalks would be provided mid-block along West 28th Street and would operate with a flagger for pedestrians to safely cross West 28th Street during specific construction phases when closed. The analysis indicated that when the north sidewalk is temporarily closed for the construction, the south sidewalk can sufficiently accommodate all of the West 28th Street peak hour pedestrian demand at an acceptable LOS.

During the last two months of construction, the MPT plans indicate that the north crosswalk at 8th Avenue and West 28th Street will be temporarily closed. This crosswalk is projected to accommodate a two-way pedestrian volume of up to 400 pedestrians during the weekday peak hours. These pedestrians would be reassigned to the east, south, and west crosswalks to complete their walk path when the north crosswalk is closed. Pedestrian conditions at the crosswalk and corners of this intersection would continue to operate at an acceptable LOS D condition or better during this construction phase (see **Table 4.7, "2025 Construction Phase Pedestrian Conditions"**).

Table 4.7: 2025 Construction Phase Pedestrian Conditions

Intersection and Element	AM Peak		MD Peak		PM Peak	
	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS	Average Space (sf/ped)	LOS
8th Avenue & West 28th Street						
Northwest corner	63	A	53	B	52	B
Northeast corner	50	B	65	A	54	B
Southwest corner	34	C	26	C	22	D
Southeast corner	85	A	89	A	69	A
North crosswalk	-	-	-	-	-	-
South crosswalk	33	C	31	C	22	D
East crosswalk	20	D	23	D	20	D
West crosswalk	39	C	30	C	31	C
West 28th Street between 8th Avenue & 9th Avenue						
North sidewalk	-	-	-	-	-	-
South sidewalk	71	A	54	B	43	B

Additionally, less than 200 incremental peak hour walk trips would be generated by construction workers during the substation construction; therefore, the construction phase is unlikely to create a significant pedestrian impact.

CONSTRUCTION ENVIRONMENTAL PROTECTION PLAN (CEPP)

MTA C&D recognizes the importance of avoiding and minimizing adverse effects and proposes to proactively implement construction techniques and/or operating procedures to reduce the potential for adverse effects. Listed below are CEPP measures that MTA C&D would implement during construction:

- Establish a project-specific pedestrian and vehicular maintenance and protection plan.
- Promote public awareness through signage, telephone hotlines, and website updates.
- Ensure sufficient alternate street and building access during the construction period.
- Communicate regularly with NYCDOT and participate in its construction coordination.

In addition, MTA C&D may develop additional project-specific mitigation measures as the Proposed Project progresses through design and construction. MTA C&D would implement a CEPP during construction, which would include proactive measures to reduce environmental effects during construction whenever possible.

4.2.12 Air Quality

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating construction activities, generally have the potential to affect air quality. Therefore, analysis of

potential impacts on air quality from the construction of the Proposed Project includes a quantitative analysis of both on-site and on-road sources of air emissions. In general, much of the heavy equipment used in construction utilizes diesel-powered engines and produces relatively high levels of nitrogen oxides ("NO_x") and particulate matter ("PM"). Fugitive dust generated by construction activities also contains PM. Finally, gasoline engines produce relatively high levels of carbon monoxide ("CO"). As a result, the primary air pollutants of concern for construction activities include nitrogen dioxide ("NO_2"), particulate matter with an aerodynamic diameter of less than or equal to ten micrometers ("PM_{10}"), particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ("$PM_{2.5}$"), and CO.

The detailed construction air quality analysis estimates the overall construction emissions profile for the Proposed Project and evaluates the worst-case analysis time periods for short-term air quality standards and annual air quality standards. Sensitive receptors were placed surrounding the Project Area, and dispersion models were used to predict and compare the concentration of pollutants to the National Ambient Air Quality Standards ("NAAQS") and/or CEQR *de minimis* impact criteria, as appropriate.

EMISSION CONTROL MEASURES

Construction activity, in general, has the potential to adversely affect air quality as a result of diesel emissions. MTA C&D requires the incorporation of construction specifications in the form of *Construction Performance Requirements* to minimize potential construction-related air quality effects. To ensure that construction of the Proposed Project would result in the lowest practicable diesel particulate matter ("DPM") emissions, an emissions reduction program would be implemented for all construction activities, consisting of the following components:

- *Clean Fuel*. Ultra-low sulfur diesel ("ULSD") fuel would be used exclusively for all diesel engines throughout the construction site.

- *Dust Control Measures*. To minimize fugitive dust emissions from construction activities, a strict fugitive dust control plan, including a robust watering program, would be required as part of contract specifications. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the construction site; truck routes within the Project Site would be either watered as needed or, in cases where such route would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the resuspension of dust; all trucks hauling loose material would be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the construction site; water sprays would be used for all demolition, excavation, and transfer of soils to ensure that materials would be dampened, as necessary, to avoid the suspension of dust into the air. Loose materials would be watered or covered. All measures required by the portion of the New York City Air Pollution Control Code regulating construction-related dust emissions would be implemented.

- *Idling Restriction*. In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time would also be restricted to three minutes for all equipment

and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

- *Best Available Tailpipe Reduction Technologies*. Non-road diesel engines with a power rating of 50 horsepower ("hp") or greater and controlled truck fleets (i.e., truck fleets under long-term contract for the Proposed Project), including but not limited to concrete mixing and pumping trucks, would utilize the best available tailpipe ("BAT") technology for reducing DPM emissions. Diesel particulate filters ("DPFs") were identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel non-road engines rated at 50 hp or greater would utilize DPFs, either installed by the original equipment manufacturer ("OEM") or retrofitted. Retrofitted DPFs must be verified by EPA or the California Air Resources Board ("CARB"). Active DPFs or other technologies proven to achieve an equivalent reduction may also be used.

- *Utilization of Newer Equipment*. EPA's Tier 1 through 4 standards for non-road engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons ("HC").[8] All non-road construction equipment with a power rating of 50 hp or greater would meet at least the Tier 3 emissions standard (alternatively at least the Tier 4 final emissions standard). All non-road engines rated less than 50 hp would meet at least the Tier 2 emissions standard.

DETERMINING THE SIGNIFICANCE OF CONSTRUCTION AIR QUALITY IMPACTS

The New York State Environmental Quality Review Act ("SEQRA") regulations and *CEQR Technical Manual* indicate that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large, or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected.[9] In terms of the magnitude of air quality impacts, any project predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS would be deemed to have a potential significant adverse impact. However, the magnitude, duration, and impacted area are taken into consideration when determining if the construction impact is significant.

In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas ("NAAs"), threshold levels were defined for certain pollutants; any project predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted. The NAAQS and CEQR *de minimis* criteria are intended for permanent project impacts and are used for screening purposes for construction impacts. If

[8] For summary of the phase in of Tiers 1-4 exhaust emission standards for nonroad compression ignition (diesel) engines, see: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf

[9] *CEQR Technical Manual*, Chapter 1, section 222, December 2020; and State Environmental Quality Review Regulations, 6 NYCRR § 617.7

construction impacts are below these thresholds, no further assessment of the magnitude and duration of impacts is needed.

CO de minimis Criteria

The *CEQR Technical Manual* provides the following *de minimis* criteria for CO: (1) an increase of 0.5 parts per million ("ppm") or more in the maximum eight-hour average CO concentration at a location where the predicted No-Action eight-hour concentration is equal to or between 8.0 and 9.0 ppm; or (2) an increase of more than half the difference between baseline (i.e., No-Action condition) concentrations and the eight-hour standard, when No-Action concentrations are below 8.0 ppm.

$PM_{2.5}$ de Minimis Criteria

The New York State Department of Environmental Conservation ("NYSDEC") has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts.[10] This policy applies only to facilities applying for permits or major permit modifications under SEQRA that emit 15 tons of PM_{10} or more annually. The policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 µg/m3 averaged annually or by more than 7.9 µg/m3 on a 24-hour basis. Projects that exceed either the annual or 24-hour threshold must assess the severity of the impacts, evaluate alternatives, and employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts of the source to the maximum extent practicable.

In addition, New York City uses *de minimis* criteria to determine the potential for significant adverse $PM_{2.5}$ impacts under CEQR, as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average $PM_{2.5}$ concentration increments that are predicted to be greater than 0.1 µg/m3 at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately one square kilometer, centered on the location where the maximum ground level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or
- Annual average $PM_{2.5}$ concentration increments that are predicted to be greater than 0.3 µg/m3 at a discrete receptor location (elevated or ground level).

[10] CP33/Assessing and Mitigating Impacts of Fine Particulate Emissions, NYSDEC 12/29/2003.

Actions under CEQR predicted to increase $PM_{2.5}$ concentrations by more than the above *de minimis* criteria are considered to have a potential significant adverse impact. The *de minimis* criteria were used to evaluate the significance of predicted impacts of construction on $PM_{2.5}$ concentrations.

METHODOLOGY

Construction phasing and equipment usage of the Proposed Project will be the same as what were proposed in 2018. As such, the methodology and assessment results presented in 2018 report as shown below are still valid. As new diesel construction equipment emission rates are lower than older equipment, it is expected that, for construction activities at the same scale, total construction equipment Air Pollutants' emissions will be slightly lower by using newer equipment. Therefore, the construction of the Proposed Project between 2021-2025 would result in less air emissions than what were reported in **Table 4.8, "Maximum Pollutant Concentrations During Construction."**

ON-SITE CONSTRUCTION ACTIVITY ASSESSMENT

Based on the construction schedule, a construction resource estimate was prepared to estimate the likely type, number, and usage data for construction equipment on a monthly basis.

The construction equipment requirements for each phase of activity were used to identify the following worst-case time periods for detailed analysis:

- **Short-term emissions peak** (used for 24-hour, 8-hour and 1-hour ambient air quality standards): January 2023. This month represents the excavation phase where the largest quantity of soil/rock would be handled on-site; therefore, the potential for fugitive dust emissions is highest.

- **Annual emission peak** (for annual average ambient air quality standards): March 2022 through February 2023. This is the first 12-months of construction encompassing site preparation, installation of secant piles and jet grouting, and excavation.

<u>Engine Exhaust Emissions</u>

Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the latest EPA NONROAD Emission Model, which is incorporated in EPA's MOVES2014a model interface. The NONROAD model is based on source inventory data accumulated for specific categories of non-road equipment. The emission factors in grams per horsepower-hour for each type of equipment, with the exception of trucks, were determined from the output files for the NONROAD model (i.e., calculated from regional emissions estimates) and the application of EPA-generated post-processing scripts. With the incorporation of DPFs (as discussed under "Emission Control Measures" above), PM emissions for equipment of 50 hp or greater would be similar to Tier 4 standards. For purposes of CO and NO_x emissions, equipment of 50 hp or greater would meet Tier 3 standards. For smaller equipment less than 50 hp, Tier 2 emission factors were utilized.

Tailpipe emission rates for NO_x, CO, PM_{10}, and $PM_{2.5}$ from heavy trucks on-site (e.g., dump trucks, concrete trucks) were developed using the most recent version of the EPA Mobile Source Emission Simulator

("MOVES2014a"), as referenced in the *CEQR Technical Manual*. Since dump trucks and concrete trucks are not available as vehicle types directly covered in MOVES2014a, combination long-haul (e.g., tractor trailer) emissions were used to represent on-road truck activity. Dump trucks were assumed to be actively traveling on the Project Site for ten minutes per truck trip at an average speed of five miles per hour ("mph"). A separate idle emission factor was determined using MOVES to account for truck idling activity. Dump trucks were assumed to idle five minutes per trip to account for loading and unloading. Concrete trucks were assumed to idle continuously throughout the workday.

Since no on-site parking is expected to be available for construction workers during construction, workers would not be driving directly to the study area; therefore, emissions associated with worker commutes were not included in the analysis.

Fugitive Emission Sources

In addition to engine emissions, fugitive dust emissions from operations (e.g., excavation and transferring of excavated materials into dump trucks) were calculated based on procedures delineated in EPA AP-42 Table 13.2.3-1.[11] The quantity of soil loaded into trucks was estimated based on the truck trip generation estimate described above under "Transportation." It was assumed that all dump truck trips would involve handling soil or construction debris, and the number of truck trips was used to determine the quantity of soil moved and potential dust emissions generated. The analysis of material handling activities also accounted for a dust control plan with at least a 50 percent reduction in PM_{10} and $PM_{2.5}$ emissions from fugitive dust through wet suppression, as discussed above in "Emission Reduction Measures." Fugitive dust emissions would primarily be a concern during excavation and site preparation activities. In later construction phases, soil handling would be minimal, and it was assumed that on-site roadways would be appropriately stabilized and watered to prevent fugitive dust.

DISPERSION MODELING

Potential impacts from non-road sources were evaluated using the EPA/American Meteorological Society ("AMS") AERMOD dispersion model (version 16216r). AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources), and the preferred model by both the EPA and NYSDEC. AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of the interaction between the plume and terrain. The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) and/or areas that aggregate fugitive dust and construction equipment emissions across the construction site, based on hourly meteorological data and has the capability to calculate pollutant concentrations at locations when the plume from the emission points/areas is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures.

[11] U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors (AP-42)*, Section 13.2.3 Heavy Construction Operations.

Location of Nearby Sensitive Receptors

Receptors were placed in publicly accessible areas and along buildings containing sensitive land uses adjacent to the Project Site, including the following:

- Two residential buildings: Penn South Building 7 and Building 9
- Public open space south of West 28th Street
- Residences along West 29th Street
- Sidewalks

In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the entire area at locations more distant from the construction sites.

Source Simulation

For the short-term model scenarios, predicting concentration averages for periods of 24 hours or less, all stationary sources, such as large cranes and pile driving rigs, were simulated as point sources. Other engines, which would move around the Project Site on any given day, were simulated as area sources. For the annual modeling scenarios, all equipment would move around the Project Site and was simulated as area sources.

Meteorological Data

The meteorological data set consisted of five consecutive years of meteorological data: surface data collected at La Guardia Airport (2012-2016) and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevations over the five-year period. These data were processed using the EPA AERMET program to develop data in a format that can be readily processed by the AERMOD model.

NO_x-NO_2 Conversion

Annual NO_2 concentrations were estimated using a NO_2 to NO_x ratio of 0.75 (Tier 2), as described in the EPA's Guideline on Air Quality Models at 40 CFR part 51 Appendix W, Section 5.2.4.

Background Concentrations

To estimate the maximum expected total pollutant concentrations, the calculated impacts from the emission sources must be added to a background value that accounts for existing pollutant concentrations from other sources. The background concentrations used for the construction air quality analysis are listed in **Table 2.11, "Representative Monitored Ambient Air Quality Data (2018-2020)."**

On-Road Sources

As discussed in the Transit and Parking, Pedestrian section above, the traffic increments during construction do not warrant detailed construction impact analysis. Therefore, a mobile source construction air quality analysis is not required. In addition, mobile sources (e.g., haul trucks, concrete

trucks) are included in the on-site construction analysis, accounting for truck idling activity on/near the construction site.

CONSTRUCTION PERIOD EFFECTS OF THE PROPOSED PROJECT

Maximum predicted concentration increments and overall concentrations, including background concentrations, are presented in **Table 4.7, "Maximum Pollutant Concentrations During Construction."** The highest concentrations would occur at sidewalk receptors and residential buildings located adjacent to the Project Site.

As shown in the tables, the maximum predicted total concentrations of 24-hour PM_{10}, one- and eight-hour CO, 24-hour and annual-average $PM_{2.5}$, and annual-average NO_2 are below the applicable NAAQS. In addition, the maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR *de minimis* criteria of 7.9 µg/m^3 in the 24-hour average period or 0.3 µg/m^3 in the annual average period. Likewise, the maximum predicted CO incremental concentrations would not exceed the applicable CEQR *de minimis* criteria of 3.75 ppm in the eight-hour average period.

Table 4.8: Maximum Pollutant Concentrations During Construction

Pollutant	Averaging Period	Units	Maximum Predicted Increment[3]	Background Concentration	Maximum Predicted Total Concentration	*De Minimis* Criteria[1,2]	NAAQS
$PM_{2.5}$	24-hour	µg/m³	6.13	19.2	-	7.9	35
	Annual	µg/m³	0.18	9.1	-	0.3	12
PM_{10}	24-hour	µg/m³	65.8	24	89.8	-	150
NO_2	Annual	PPB	5.9	18.3	24.0	-	53
CO	One-hour	PPM	0.68	2.0	2.68	-	35
	Eight-hour	PPM	0.23	1.5	1.73	3.75	9

Notes:
$PM_{2.5}$ and eight-hour CO concentration increments are compared to the de minimis criteria. Increments of all other pollutants are compared with the NAAQS to evaluate the magnitude of the increments. Comparison to the NAAQS is based on total concentrations.

[1] $PM_{2.5}$ de minimis criteria are defined as: (a) 24-hour average not to exceed more than half the difference between the background concentration and the 24-hour NAAQS; and (b) annual average not to exceed more than 0.3 µg/m³ at discrete receptor locations.

[2] 8-hour CO de minimis criteria are defined as: (a) an increase of 0.5 ppm or more in the maximum eight-hour average CO concentration at a location where the predicted No-Action eight-hour concentration is equal to eight ppm or between eight ppm and nine ppm; and (b) an increase of more than half the difference between baseline (i.e., No-Action) concentrations and the eight-hour standard, when No-Action concentrations are below eight ppm.

[3] "Maximum Predicted Increment" values from Louis Berger International, 2018 (now a part of WSP Global Incorporated).

Mg/m³ - micrograms per cubic meter
PPB - parts per billion
PPM - parts per million

Therefore, construction of the Proposed Project would not result in significant adverse impacts to air quality.

4.2.13 Noise and Vibration

Potential effects from noise and vibration on the surrounding community due to the construction of the proposed substation were evaluated. Evaluation of construction-related noise and vibration considered anticipated construction conditions (including construction schedules, plans and construction methods), and nearby land uses.

Construction conditions were analyzed based on noise and vibration generated by individual pieces of construction equipment, the amount of time the equipment would be in use, and the distance between the equipment and potential sensitive receptors. It is anticipated that construction activity for the proposed substation would occur over an approximate three-year period, and would encompass eight phases of construction, as follows:

- Site preparation: installation of construction fence; removal of the street surface; test pits and soil borings to determine subsurface conditions; utility relocation; preparation of laydown and truck staging areas; and installation of the guide wall for secant pile drilling/alternative installation methods.
- Pile installation
- Excavation

- Foundations and structure: installation of foundation and structural steel
- Concrete pours for the structure
- Installation of equipment
- Site restoration
- Trackwork, cabling, testing

The technical approach, methodology, and impact criteria for the noise and vibration analyses were taken from the Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Manual* (FTA, 2018), which relates to transit projects such as the proposed substation. While MTA C&D construction of the proposed substation is not currently anticipated to receive federal funding requiring the use of FTA noise and vibration construction guidance, the FTA guidance was considered in the analysis under SEQRA for purposes of identifying appropriate noise reduction measures and appropriate vibration control measures. For the control of construction noise, the requirements of the 2007 NYC Noise Code (15 RCNY 47-01 et seq) would be adhered to by the contractor, based on strict language included in the construction contract. The NYC Noise Code limits the hours of construction and requires contractors to prepare and implement a noise management plan, among other requirements. For the control of construction vibration, the requirements of the New York City Department of Buildings ("DOB"), including construction guidance for historical structures, Technical Policy and Procedure Notice #10/88 (TPPN # 10/88) would be adhered to by the contractor, also based on strict language included in the construction contract.

While annoyance from construction-related vibration is a relevant consideration in the analysis, the primary concern with construction-related vibration, as defined by FTA, applies to the potential for building damage and damage to subsurface NYCT infrastructure (e.g., subway box). Therefore, FTA vibration damage criteria are utilized in this report to determine potential impacts. They are identical to the DOB's TPPN # 10/88. It should be noted that equipment expected to be used in substation construction, such as jackhammers, drilling rigs, and excavators, does not generate substantial area-wide vibration, and the impact of such equipment is typically more localized, potentially affecting only structures adjacent to the proposed limits of construction.

NOISE

Guidelines and Criteria

FTA construction guidelines state that a noise assessment may be qualitative or quantitative depending on the scale and scope of a construction project. Qualitative assessments are usually conducted for projects that last for a short period of time or employ equipment that would not create a substantial amount of noise. For projects that are lengthier and employ noisier equipment, a quantitative analysis may be more appropriate. For a quantitative analysis, either a general or a detailed assessment may be provided.

The general noise assessment uses the one-hour L_{eq} to set thresholds for construction activities. Detailed noise assessments use a set of threshold eight-hour L_{eq} levels for various construction activities. The noise criteria and the descriptors used to evaluate project noise, including operation and construction noise, depend on the type of land use and the construction operating schedules in the vicinity of the Proposed Project.

Table 4.9, "FTA General Assessment Criteria for Construction Noise," and **Table 4.10, "FTA Criteria for Detailed Construction Noise Analysis,"** present the FTA construction noise criteria for the general and detailed assessments, respectively. Using FTA guidelines, an airborne noise impact would occur if noise levels during construction exceed these FTA-recommended values.

Table 4.9: FTA General Assessment Criteria for Construction Noise

Land Use	1-hour L_{eq} (dBA)	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: FTA, Transit Noise and Vibration Assessment, September 2018.

Table 4.10: FTA Criteria for Detailed Construction Noise Analysis

Land Use	8-hour L_{eq} (dBA)	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: FTA, Transit Noise and Vibration Assessment, September 2018.

The proposed substation has an approximate 36-month construction period that would use construction equipment on the higher end of the noise level spectrum. A qualitative assessment is not appropriate because residential receptors are located close to the construction area. Therefore, a detailed quantitative assessment is appropriate for assessing the proposed substation's construction noise. While MTA C&D is not bound by the FTA criteria guidelines, it is used in this report for the purposes of identifying the potential construction effects so that appropriate noise reduction measures can be applied.

In addition, criteria used in the analysis was developed by MTA C&D relating to maximum allowable displacement vibration limits for their construction projects "to preserve the safety and stability of foundations, walls, and other parts of buildings and structures and to prevent any disturbance or damage thereto". The threshold limits are related to levels of vibration that require a response action above the maintenance and protection measures provided by the contractor. The Response Action Levels, as defined in Specification 2F - Maintenance, Support and Restoration of Buildings are Alert Threshold Values and Upset Limiting Values. Alert Threshold Values, a value level that triggers a response when the

established vibration levels are exceeded, is defined as vibration levels that require mandatory evaluation of the current construction methodology. A Response Action Plan is required for the construction activities by the contractor, and this plan may be implemented to avoid detrimental effect to the structures and to avoid reaching the Upset Limiting Values. The Upset Limiting Values, i.e., when the established Upset Limiting Value levels have been exceeded, requires the cessation of work. The Response Action Plan and required mitigative action will also be implemented to prevent damage to surrounding facilities.

Methodology

Using FTA's recommended quantitative assessment methodology, noise associated with Proposed Project construction was analyzed to identify potentially affected noise receptors near the construction zone. Receptors representative of the typical neighborhood land use and located closest to the construction areas for the project were chosen. As shown on **Figure 2.12, "Noise Monitoring Location,"** and **Figure 4.2, "Vibration Receptors,"** these include Penn South Building 7, located approximately 95 feet west of the construction site; Penn South Building 8, located approximately 125 feet south of the construction site; and Penn South Building 9 located approximately 50 feet east of the construction site, as well as the open space surrounding the construction site. For the noise assessment, per the FTA manual, typical 1-hour L_{eq} noise levels were predicted at these locations.

Mobile Noise Sources

Noise from mobile source off-site construction vehicles is not included in the project construction noise assessment. The construction of the Proposed Project would not result in street closures and traffic diversions. Furthermore, the projected number of construction vehicles generated during any one hour would not be substantial with respect to noise, because there would be no doubling of traffic volumes or traffic Passenger Car Equivalents ("PCEs") on any of the affected roadways. According to the analysis of traffic conditions, construction of the proposed substation would generate approximately 14 PCEs during the peak weekday traffic period, from 6:00 AM to 7:00 AM.

Therefore, any increase in noise levels from off-site mobile source construction vehicles would not have the potential to result in significant adverse impacts related to noise.

Stationary Noise Sources

Stationary noise sources consist of off-road construction equipment that would be used during construction as well as on-road vehicles operating on-site. Identification of stationary construction equipment to be used during the construction period is the product of a multi-step process that analyzes the foreseeable construction process based on the proposed design and available project information. Construction activities were derived from an overall construction schedule that incorporated inputs such as construction duration, stage activities, equipment type, number of pieces of equipment, and hours worked per day.

Another essential input used to calculate construction noise levels at each noise sensitive receptor is the acoustical usage factor ("AUF"). This is the percentage of time that a particular piece of equipment is expected to be operated at full power setting while on-site during construction. Since the construction equipment is not expected to be in operation at full power continuously, an AUF was assigned to each piece of equipment based on equipment usage cycles recommended by the equipment manufacturer. The equipment reference noise levels and AUF, which are shown on **Table 4.11, "Typical Noise Emission Levels for Construction Equipment,"** were based on data contained in the FTA Transit Noise and Vibration Impact Assessment (September 2018) guidelines and the FHWA's Roadway Construction Noise Model ("RCNM") data, and included equipment expected to be utilized during construction.

Given these parameters, typical noise emission levels from construction activities that use equipment such as excavators, loaders, cranes, generators, and drilling rigs were used as a basis to evaluate potential noise impacts at sensitive receptor locations in the study area.

Table 4.11: Typical Noise Emission Levels for Construction Equipment

Equipment Description	Usage Factor (%)	L_{max} @ 50 Feet
Auger Drill Rig*	20	85
Backhoe	40	80
Impact Pile Driver*	20	95
Vibratory Pile Driver*	20	95
Compactor (ground)	20	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Crane	16	85
Drill Rig Truck	20	84
Dump Truck	40	84
Flat Bed Truck	40	84
Generator	50	82
Jackhammer	20	73
Pickup Truck	40	55
Pumps	50	77
Note: * Either auger drill rig, impact pile driver, or vibratory pile driver may be used for construction, however not all pieces of equipment will be used.		

Source: Local Law 113 and the NYCDEP Notice of Adoption of Rules for Citywide Construction Noise Mitigation: Chapter §28-109

The quantification of these noise levels was performed using RCNM. The modeling procedure accounts for numerous pieces of equipment operating concurrently. The use of decibel addition[12] is then employed to account for the combination of construction equipment pieces being used. The model equation inputs account for construction equipment noise emissions and AUFs as well as the distance between the equipment and the receiver being analyzed. Per FTA guidance, and for the purposes of analysis, all equipment was assumed to be operating in the center of the construction zones.

[12] It is important to note that the noise decibel is a logarithmic unit. Therefore, when combining noise levels from different construction equipment and activities, decibels are summed using logarithmic and not arithmetic addition. For example, when two noise sources at 85 dB each are combined, the resulting total noise level would be 88 dB and not 170 dB.

Impact Results

For stationary sources, noise calculations for the construction activities and construction methodologies were conducted for the noisiest construction periods, site preparation through concrete pours, as identified above. The maximum L_{eq} noise level was predicted for each of the three representative noise receptors surrounding the proposed substation construction zone, Penn South Buildings 7, 8, and 9, and the residences located along West 29th Street north of the construction site. Because detailed construction methodology is unknown at this time, a range of construction methodologies are considered for noise analyses. Results are listed in **Table 4.12, "Maximum Construction Noise at Receptor Locations."**

Noise results indicate that during the early stages of construction, particularly related to the Project Site preparation activities, noise would be less than the FTA guideline values. These activities involve the use of tools such as jackhammers and backhoes to facilitate the initial breaking up and excavation of the surface. In addition, major excavation of soil would commence for the relocation of utilities, if necessary. However, once this phase is completed, it is expected that continued excavation and most other construction activities would generate less noise. Construction activities would occur only during daytime hours, and noise levels would not last for the entire duration of the phase because construction would not be occurring continuously at all times during the phase.

Depending on the task, there would be times during the construction day where noise levels are lower than those identified above, and this would be considered intermittent noise. Considering the magnitude of the construction noise, this intermittent daytime nature of the noise, and the MTA C&D construction noise best management practices ("BMPs") commitments, construction of the Proposed Project would not result in significant adverse impacts related to noise.

Table 4.12: Maximum Construction Noise at Receptor Locations

Construction Phase	Noise Receptor ID. (Penn South)	Description	Distance from Center of Construction Zone (ft)	FTA Construction Guidelines L_{eq} (dBA)	Predicted Peak L_{eq} (dBA)[1]
Site Prep	Building 9	Residential	101	80	79.8
	Building 7	Residential	127	80	77.8
	Building 8	Residential	207	80	73.6
Auger Drill Rig	Building 9	Residential	101	80	76.8
	Building 7	Residential	127	80	74.9
	Building 8	Residential	207	80	70.6
Impact Pile Driver	Building 9	Residential	101	80	**88.4**
	Building 7	Residential	127	80	**86.4**
	Building 8	Residential	207	80	**82.1**
	Building 9	Residential	101	80	**87.9**

Construction Phase	Noise Receptor ID. (Penn South)	Description	Distance from Center of Construction Zone (ft)	FTA Construction Guidelines L_{eq} (dBA)	Predicted Peak L_{eq} (dBA)[1]
Vibratory Pile Driver	Building 7	Residential	127	80	**86.0**
	Building 8	Residential	207	80	**81.7**
Excavation	Building 9	Residential	101	80	76.5
	Building 7	Residential	127	80	74.5
	Building 8	Residential	207	80	70.2
Structural Foundations	Building 9	Residential	101	80	76.9
	Building 7	Residential	127	80	74.9
	Building 8	Residential	207	80	70.6
Concrete Pours	Building 9	Residential	101	80	74.6
	Building 7	Residential	127	80	72.6
	Building 8	Residential	207	80	68.3

Note:
[1] Predicted maximum levels presented in bold type are above the impact criteria

Findings

The worst-case noise levels would occur during the Project Site preparation phase, from the installation of the SOE. Once site preparation is completed, noise levels would decrease somewhat because fewer pieces of noisy equipment would be required and many construction activities would shift to below ground level. Predicted noise levels for the construction phases related to the Proposed Project would be below the FTA noise guidelines at the three Penn South residential building and the residences along West 29th Street unless an impact or vibratory pile driver were used.

As shown in **Table 4.12, "Maximum Construction Noise at Receptor Locations,"** if construction were to include the use impact pile drivers or vibratory pile drivers, the pile installation stage of construction would generate noise levels above FTA noise guidelines. Pile installation using an auger drill rig would not generate noise above the FTA noise guidelines.

Pile installation using a vibratory pile driver would generate noise levels exceeding the FTA construction guidelines (80 dBA L_{eq}) by approximately 7.9 dB at Penn South Building 9, approximately 6.0 dB at Penn South Building 7, and approximately 2.7 dB at Penn South Building 8.

Mitigating the noise impacts associated with pile driving includes the use of shrouds or curtains to reduce noise levels by 15 to 30 dB(A). Additional measures include reducing the amount of time required for pile driving and informing the community of the expected schedule and duration.

The noise from the pile drivers would be minimized by assuring the contractors strict adherence to the revised 2007 NYC Noise Code, and management measures identified in the MTA C&D construction contracts. Additionally, construction would only occur during daytime hours. Finally, because the sources of noise would migrate throughout the construction area, the effects of construction noise on the sensitive receptors would change depending on the location of particular noise sources. Note also that noise-generating activities would be intermittent and of short-term durations.

The MTA C&D construction contract specification requires the contractor to prepare Construction Noise Management Plans as set forth in the revised 2007 NYC Noise Code. Based on these requirements, the contractor must implement and adhere to the noise management plan measures as required. It should be noted that several constraints, such as the proximity of construction activities and limited spaces between buildings and the construction area, may limit the practicability of, and the potential benefits from, such measures.

Construction Specifications to Reduce Noise Emissions

Contractors would be obligated to comply with all of the requirements and regulations of the New York City Noise Code. Devices and activities that are subject to the provisions of the New York City Noise Code would be operated, conducted, constructed, or manufactured without causing a violation of the code. All work would be conducted in compliance with the regulations set forth below controlling maximum noise levels from construction work. At the construction site, special precautions and noise abatement measures would be taken by the contractor to reduce public exposure to noise.

Other measures and strategies to reduce noise levels would be considered by MTA C&D to meet the NYC Noise Code requirements. MTA C&D would review and consult regarding which measures are most effective and practicable. These measures and strategies may include:

- Use of OSHA-compliant, quieter, manually adjustable backup alarms set to their low level.
- Use of shields and/or impervious fences to inhibit transmission of noise.
- Use of noise enclosures or noise insulation fabric on compressors, generators, and other equipment.
- Use of effective intake and exhaust mufflers on internal combustion engines and compressors.
- Lining or covering hoppers, storage bins, and chutes with sound-absorbing material.
- Avoiding the use of pneumatic or gasoline driven saws.
- Employing alternative construction methods, using special low noise emission level equipment, and selecting and specifying quieter demolition method.

- Routing construction equipment and other vehicles carrying spoil, concrete, or other materials over streets and routes that will cause the least disturbance to residents in the vicinity of the activity.

- Designing considerations and project layout approaches, including measures such as construction of temporary noise barriers, placing construction equipment farther from noise sensitive receptors, constructing walled enclosures/sheds around especially noisy activities such as pavement breaking, and sequencing operations to combine especially noisy equipment.

- Developing and implementing a noise monitoring program in order to quantify noise levels at nearby sensitive receptors during construction.

- Use of the quietest model of jackhammer available such as the Copco model TEX P90s.

- Implementing a community liaison and complaint hot line.

VIBRATION

Guidelines and Criteria

Measurements of vibration used in this evaluation are expressed in terms of the peak particle velocity ("PPV") in the unit of inches per second ("ips"). The PPV, a quantity commonly used for vibration measurements, is the maximum velocity experienced by any point in a structure during a vibration event. It is an indication of the magnitude of energy transmitted through vibration. PPV is an indicator often used in determining potential damage to buildings from stress associated with blasting and other construction activities such as impact pile driving. No blasting will be used for excavation for the project.

Potential impacts related to construction vibration would be of limited duration. The primary concern regarding construction vibration would be related to potential damage to buildings and the subway box. Damage criteria are based on the PPV levels generated by different types of construction equipment. For structural damage, the FTA identifies criteria for several categories of buildings that could be affected, the most sensitive of which include historic structures. Penn South Building 7 is an S/NR listed historic resource constructed with modern material (location of the Bayard Rustin Apartment). The Penn South development is eligible for S/NR listing, and is also constructed of modern materials. In areas adjacent to, or nearby, the construction activities, the buildings are reinforced concrete or steel structures, and engineered masonry and non-engineered masonry. For these building types, the FTA threshold criteria for cosmetic damage are vibration levels of 0.50 ips, 0.30 ips, and 0.2 ips, respectively. The DOB's construction guidance for historical structures, TPPN #10/88, also recognizes the building damage threshold as 0.50 ips.

Construction vibration damage criteria for various types of buildings are listed in **Table 4.13, "Construction Vibration Damage Criteria."** To be conservative for this assessment, it is assumed that the brick residential structures on West 29th Street are non-engineered masonry structures.

The subway box is located approximately 200 feet east of the proposed substation and would not be affected by vibration of the structure. The trench leading from the substation to the subway box would not require equipment or construction processes that create significant vibration.

Table 4.13: Construction Vibration Damage Criteria

Building Category	PPV (ips)*
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
* RMS velocity in decibels, VdB re 1 micro-in/sec	

Source: FTA Noise and Vibration Impact Assessment, September 2018.

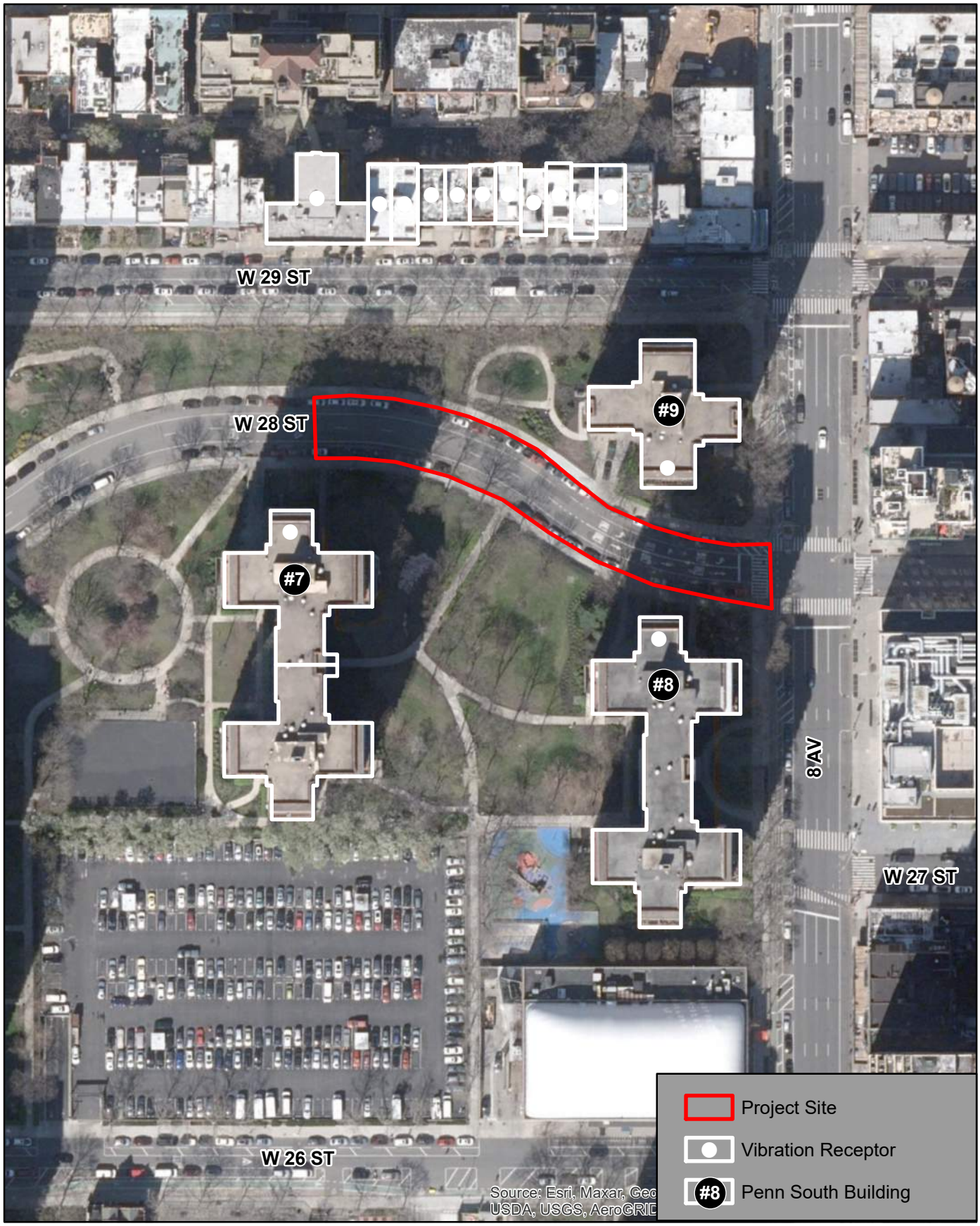
FTA guidance also provides annoyance criteria limits for construction-related vibration. The FTA annoyance criteria is 72 vibration decibels ("VdB") for residential land uses. This criterion is associated with events that are likely to occur frequently (such as use of jackhammers) over the course of one day.

Methodology

A quantitative assessment of vibration impacts was performed based on FTA guidelines and the review of the Proposed Project construction plans and schedules. Based on review of boring logs from the Project Site and study area, bedrock is not expected to be encountered during excavation.

Construction for the proposed substation involves installation of the SOE using different construction methodologies along the perimeter of the underground structure. Potential worst-case impacts related to building damage were assessed for nearby receptors, as shown on **Figure 4.2, "Vibration Receptors."** For the assessment, the resulting peak particle velocity levels were adjusted for distance and compared to damage criteria for building types listed in **Table 4.13, "Construction Vibration Damage Criteria."** The construction information used in assessing vibration included construction activities, equipment types, and vibration emission levels. Levels of vibration ("PPV") caused by auger drilling at various distances are listed in **Table 4.14, "Drilling Vibration Levels Anticipated at Receivers."**

Buildings potentially affected by construction vibration and evaluated in this assessment include those situated within 50-feet from the SOE construction and include Penn South Buildings 7, 8 and 9, and the closest residence on West 29th Street, which is located approximately 130 feet north of the construction site, as shown on **Figure 4.2, "Vibration Receptors."**



Source: Esri, GigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; New York City Department of City Planning, 2022; STV Incorporated, 2022.

N

0 50 100 200 Feet

MTA Construction and Development

Proposed Substation
West 28th Street & 8th Avenue Line

Figure 4.2

VIBRATION RECEPTORS

Impact Results

The secant piles for the project would be located around the perimeter of the underground structure at distances from the various receivers as listed in **Table 4.14, "Drilling Vibration Levels Anticipated at Receivers."**

Also shown in the table is the assumed FTA building construction category (conservative assumption) and associated impact criteria, the receiver building identification number, and anticipated vibration levels received at the property. Because detailed construction methodology is unknown at this time, a range of construction methods are considered for vibration analyses. The impact pile driver and vibratory pile drivers have a higher potential for impacts, so these methods were analyzed as a worst-case scenario.

As listed in **Table 4.14, "Drilling Vibration Levels Anticipated at Receivers,"** drilling adjacent to Penn South Building 9, the closest receiver, would generate vibration levels below the FTA's 0.3 ips vibration guidelines for potential cosmetic damage to nearby structures. Vibration levels at all receivers are well below the appropriate impact threshold. However, the upper and typical range of potential vibration are presented because there is a considerable variation in reported ground vibration levels from construction activities. The data provide a reasonable estimate for a wide range of soil conditions.

Table 4.14: Drilling Vibration Levels Anticipated at Receivers

Receiver (Penn South)	Category (Impact Criteria)	Distance (feet)	Auger Drill PPV (ips) Typical Range	Impact Driver PPV (ips)‡ Upper/Typical Range¥	Vibratory Drivers PPV (ips)‡ Upper/Typical Range¥
Building 7	II (0.3 ips)	95	0.012	Upper 0.205/ Typical 0.087	Upper 0.099/ Typical 0.023
Building 8	II (0.3 ips)	125	0.008	Upper 0.136/ Typical 0.058	Upper 0.066/ Typical 0.015
Building 9	II (0.3 ips)	50	0.031	Upper **0.537/** Typical 0.228	Upper 0.260/ Typical 0.060
West 29th St (Block 753/Lot 25)	III (0.2 ips)	130	0.008	Upper 0.128/ Typical 0.054	Upper 0.062/ Typical 0.014

Notes:
**** MTA C&D's general construction specifications, Section 2F - Maintenance, Support and Restoration of Buildings.***
¥ Vibration values from Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.
‡ Vibration values in bold indicate levels above impact criteria.

As shown in **Table 4.14, "Drilling Vibration Levels Anticipated at Receivers,"** the use of impact pile drivers would generate vibration levels above the Impact criteria values at Penn South Building 9 if the hammer energy is in the upper range. If hammer energy is reduced, it is possible that vibration levels would be below the impact criteria. The use of auger and vibratory pile drivers would not generate vibration levels above impact criteria.

Vibration exceeding the impact criteria may cause cosmetic damage to nearby structures (depending on Building Category and distance from construction), and although unlikely, may cause structural damage to more fragile buildings. Possible mitigation measures for impact pile driving include:

- installation of low soil displacement piles, e.g. H-piles, instead of high soil displacement piles (e.g., concrete piles), can reduce ground and structure vibrations;

- substantial decrease of the hammer energy can be helpful; however, slight reduction of the hammer energy will have a small effect because PPV of ground vibrations depends on the square root of the hammer energy;

- pile driving operations should start nearby the existing structures and continue away from the structures because previously driven piles act as a shield and soil movements are greater in the direction away from the stiffer zone around the driven piles.

Vibration Annoyance

MTA C&D would use vibration control measures to minimize, as much as possible, the vibration levels in the construction site. The contractor would comply with extensive monitoring for vibration of all building/structures adjacent to the construction area pursuant to MTA C&D's contract specification for Maintenance, Support and Restoration of Buildings. Types of control measures specific to each type of construction activity, may include the following:

- Use of deep saw-cuts to minimize the transmission of vibrations from pavement breaking operations to foundations of nearby structures.

- Use of concrete cutters on pavement surfaces instead of pavement breakers, where practical.

- Routing of truck traffic and heavy equipment to avoid impacts to the more sensitive residential receptors.

- Developing and implementing a vibration-monitoring program during highly disruptive construction activities, such as drilling.

- Properly securing decking over cut-and-cover excavations.

- Minimization of the duration of vibration activities.

- Informing people living and working in the vicinity about construction method, possible effects, quality control measures, precautions to be used; and the channels of communication available to them.

Findings

Based on **Table 4.14, "Drilling Vibration Levels Anticipated at Receivers,"** if secant piles are installed with an auger drill rig, projected vibration levels for construction equipment related to the Proposed Project would not exceed the damage criterion of 0.3 ips at Penn South Buildings 7, 8 and 9 in the study area, nor would vibration levels exceed the damage criterion of 0.2 ips at the residences along West 29th Street. If a vibratory pile driver is used, vibration levels would be higher than those generated by an auger rig but

would still be less than the damage criteria. Pile installation with an impact pile driver with a high energy hammer, vibration levels would exceed damage criteria. No vibration damage impacts are anticipated provided installation using an auger rig or a vibratory pile driver.

As noted above in Guidelines and Criteria, the FTA vibration annoyance criteria is 72 VdB. This would be surpassed at Penn South Building 9 for all of the potential pile driving methods. MTA would require the contractor to use vibration control measures, and if the contractor determined that the impact pile driver was the appropriate means and method for installation of the SOE, MTA C&D would require that the contractor use a low impact hammer to prevent exceedances of the vibration annoyance criteria at Penn South Building 9.

Therefore, construction of the Proposed Project would not result in significant adverse impacts related to vibration annoyance.

4.2.14 Cumulative Effects

Based on a field survey conducted on August 25, 2021, and a review of the Zoning Application Portal ("ZAP") data, provided by the New York City Department of City Planning ("NYCDCP") and accessed via https://zap.planning.nyc.gov/projects on October 15, 2021, five development projects are anticipated to be undertaken within the vicinity of the Project Site, as detailed in **Table 3.1, "2025 No-Action Development Projects."** Two of the identified development projects, 241 West 28th Street and 335 Eighth Avenue, are located within 400 feet of the Proposed Project; however, these projects are not located close enough to the Project Site to result in any interfere with construction activities associated with the Proposed Project. Prior to construction, if any other projects were identified in the vicinity of the project area, MTA C&D, NYCDOT and any additional agency involved in the proposed construction activity would coordinate any area construction activities to ensure there would be no cumulative effects from the overlapping construction to the community within the study area.

While the Proposed Project would represent a marginal increase in the overall amount of construction in the area, it is not anticipated to result in any effects that could, in combination with the effects of nearby construction, result in a significant adverse change compared to No-Action conditions. Therefore, the Proposed Project would not result in cumulative effects at the Project Site or within the study area.

4.3 OPERATION PERIOD ANALYSES

The operation of the Proposed Project would not result in any significant adverse impacts given that the proposed substation structure would be located underground within the NYCDOT roadbed and any operational effects would generally be contained to the area beneath the Project Site. Specifically, as described following, the Proposed Project would not result in significant adverse impacts to transportation, air quality, noise and vibration, and resiliency.

The operation of the Proposed Project would not result in significant adverse impacts related to transportation. The Proposed Project would not result in an increase in vehicular volumes or parking

demand. No permanent changes to the existing street network are proposed. The limited street network and parking restrictions in place during construction would be temporary and would revert back to existing conditions (public parking, one-way road network) once the proposed substation is constructed. No permanent changes would result from the Proposed Project. Further, the Proposed Project would provide permanent improvements to the safety and continuity of transit service. Without the Proposed Project, the existing subway line would not have the capacity to support the CBTC operation and would remain underpowered.

Further, there are no permanent sources of pollutant emissions associated with the Proposed Project, and trips generated for maintenance-related activities would be minimal. Given that the Proposed Project comprises a below grade substation, the operation of the Proposed Project would not result in increased noise or vibration levels. Therefore, the operation of the Proposed Project would not result in significant adverse impacts related to air quality or noise and vibration.

With regards to resiliency, the 1 percent AEP will gradually extend further into Manhattan, as projected by the New York City Panel on Climate Change ("NPCC"); however, based on the Project Site elevation and the latest sea level rise ("SLR") projections, the Project Site has little vulnerability to coastal flooding due to SLR in the coming century. Further, the Proposed Project would not introduce additional impervious surface to the Project Site, nor would it otherwise introduce elements that would increase the potential for flooding in the vicinity of the Project Site. Upon construction completion, the Project Site would be restored to its existing conditions to the extent practicable. Therefore, the operation of the Proposed Project is not anticipated to result in significant adverse impacts related to resiliency.

4.3.1 Electromagnetic Fields ("EMF")

Electrical systems produce both electric and magnetic fields. Electric fields result from the strength of the electric charge (voltage), while magnetic fields result from the motion of the charge (amperage).

The following discussion exclusively addresses AC (alternating current) ELF (extremely low frequency, 60 Hz) magnetic fields. The term commonly used is "EMF," which is used to denote "electromagnetic fields" or "electric and magnetic fields" and is commonly used as shorthand for 60Hz magnetic fields. EMF is invisible, non-ionizing, low-frequency radiation. Electric and magnetic fields are common throughout nature and are produced by all living organisms.

Concern related to EMF exposure appears to be focused on human-made sources of electromagnetism and that the increased levels of exposure that may have adverse biological effects. Exposure to electric fields from EMF generating facilities like substations and transmission lines, however, typically do not present a human health risk since these fields are effectively shielded by materials such as trees, walls, etc. Other concerns related to EMFs focus on exposure to magnetic fields (i.e., the invisible fields created by moving charges) from transmission lines. Literature indicated that magnetic fields cannot be easily shielded, but can be reduced by self-cancellation, depending upon the configuration of the lines. The closer the phases (wires that carry the circuit current) are configured, the greater the effect of field

cancelation, which reduces the distance from the circuit that the magnetic field would be detectable. The magnetic fields or "field strength" is expressed in milliGauss (mG).

To provide specific information related to EMF, a EMF/I Literature Review was conducted by STV, Inc. in February 2022, and is included as an Attachment (**Attachment A**). The following are excerpts from the Memorandum that was prepared.

Major health industry statements indicate that there are no known health effects from electromagnetic fields associated with substations. As a result, there are no regulatory requirements associated with EMF and the installation of substations. This finding appears to be consistent in the overall literature review.

Below is an excerpt from a EMF section that was prepared for the **No. 7 Subway Extension- Hudson Yards Rezoning and Development Program FGEIS** by a MTA subconsultant. This provides an example of the results of studies on EMF and the perceived impacts to public health.

This project is located near the proposed West 28th Street substation location. The subconsultant prepared this report relying on data from Con Edison (ConEd) substations, data provided by the Illinois Institute of Technology Research (IITRI), and studies by Enertech Consultants for the Electric Power Research Institute (EPRI) [Attachment A: 1]. The subconsultant also obtained measurements on site and in the surrounding neighborhood to support the findings.

Health Effects- Excerpt from No. 7 Line Report

Over the past two decades there has been significant research investigating the potential for exposure to EMF to adversely affect human health. Health concerns have included a variety of diseases and other health endpoints such as reproductive outcomes. Concerns about the possible effect of EMF on human health originally focused on electric fields, but much of the recent research has focused primarily on magnetic fields.

To date, there is no sound medical or scientific basis to conclude that EMF causes cancer or any other disease. Neither the medical nor scientific communities have been able to provide any numerical exposure value or foundation upon which Federal or State regulatory bodies could establish a standard or limit for public exposure that is known to be either safe or harmful. There are no Federal or State standards related to the public health effects from electric and magnetic fields to serve as a basis for determining a level of impact. However, the New York State Public Service Commission established an engineering-based magnetic field standard of 200 mG applicable at the edges of new transmission line rights-of-way. The standard was designed to ensure that magnetic field levels around new transmission lines do not exceed magnetic field levels around existing transmission lines.

Although there is no sound medical or scientific basis to conclude that EMF causes cancer or any other disease, Con Edison designs and constructs substations to reduce potential magnetic field impacts in adjacent areas through careful positioning of equipment and use of shielding, as deemed appropriate. By designing substations in this manner, Con Edison has succeeded in limiting magnetic fields from the substations in adjacent areas to levels that are significantly below the PSC standard. Therefore, it can be concluded that the substation(s) associated with the Proposed Action are not expected to have any significant adverse EMF impacts.

All studies indicate that use of electric power is ubiquitous and the use of electric power creates power EMF. It is impossible to avoid exposure to EMF, as it is emitted by everyday electrical instruments (e.g., hair dryers, small appliance transformers) and such exposure can easily range into the hundreds or even thousands of milliGauss. In New York, as with any urban area in a developed country, walking down or across streets will produce periodic exposure into the hundreds of milliGauss from overhead distribution and buried electrical circuits and building transformers and network vaults.

As detailed in the *EMF Design Guidelines for Electrical Facilities* (2006), EMF reduction techniques are available. Coordination with ConEd will be conducted during the design and construction for the safe installation of the Proposed Project.

Chapter 5: Mitigation

Effects related to noise and vibration during construction from the impact pile driver with a high impact hammer during installation of the SOE were identified.

The MTA C&D construction contract specification requires the contractor to prepare Construction Noise Management Plans as set forth in the revised 2007 NYC Noise Code. MTA would require the contractor to use vibration control measures, as well. In addition, if the contractor determined that the impact pile driver was the appropriate means and method for installation of the SOE, MTA C&D would require that the contractor use a low impact hammer to prevent exceedances of the vibration annoyance criteria at Penn South Building 9.

Any potential impacts to historic resources from vibration would be addressed through the formal consultation process and the development of a Cultural Resources Management Plan ("CRP") that would include construction monitoring. Vibration monitoring would be applied to designated NYC Landmarks and S/NR-listed historic buildings located within 90 linear feet of a proposed construction site. The S/NR Building 7 of Penn South is within 90 feet of the construction zone. With the monitoring in place, potential impacts related to construction would be managed so that mitigation would not be required during construction.

All practicable and feasible efforts to avoid and minimize effects would be implemented, such as pre-planning for construction activities, implementation of management plans and SOE planning.

As noted earlier, the identified effects associated with construction would be temporary and would not be of a scale or magnitude that would amount to a substantial effect, requiring mitigation.

Chapter 6: Property Acquisition and Use

There are no above-ground property acquisitions anticipated for the Proposed Project. The substation would be constructed underground, so the use of the NYCDOT sidewalk for the installation of vents and access panels, as well as the widening of the northern sidewalk would be approved via a permit from the NYCDOT.

There are approximately five mature trees located within Penn South property that are planted parallel to the 500-foot Project Site. A Tree Protection Plan that includes standard tree protection measures to be installed during construction will be developed prior to construction, therefore, a temporary construction easement may be required for the installation of these measures.

Chapter 7: Permits and Approvals

REGULATORY CONTEXT

MTA C&D has determined that, in accordance with New York State Public Authorities Law §1266-c(11), the proposed work would be exempt from the New York State Environmental Quality Review Act ("SEQRA") as codified in Article 8 of the New York State Environmental Conservation Law (ECL Sections 8-0101 et seq.) and its implementing regulations in Title 6 of the New York Codes, Rules and Regulations (6 NYCRR Part 617). This exemption is because, as specified in Public Authorities Law §1266-c(11), the Proposed Project is: "a MTA C&D project to be constructed upon real property theretofore used for a transit or transportation purpose, or on an insubstantial addition to such property contiguous thereto, which would not change in a material respect the general character of such prior transit or transportation use." Nevertheless, environmental documentation (i.e., EDDA) prepared is to be consistent with requirements of SEQRA, and, where appropriate, with New York City's *City Environmental Quality Review* ("CEQR"), Executive Order (E.O.) 91 of 1977 as amended, and the technical guidance of the New York *CEQR Technical Manual*, 2014 Edition, and with relevant New York City codes and regulations. Additionally, this Proposed Project would be analyzed according to certain criteria to ensure that it is consistent with the New York State Smart Growth Public Infrastructure Policy Act.

Section 106 of the National Historic Preservation Act of 1966 contains provisions and requirements for public outreach activities. E.O. 12898 also references effective public outreach as an important component of federal decision-making related to environmental justice. In accordance with federal guidelines, the SHPO consultation has been started, and no potential environmental justice communities are likely to be affected, except for the general benefit of improved subway operations with the construction of the substation.

APPROVALS, PERMITS AND COORDINATION

The various permits and approvals that would be required to implement the Proposed Project are identified in **Table 7.1, "Approvals, Permits, and Coordination Required."**

Table 7.1: Approvals, Permits, and Coordination Required

Approval/Permit/ Coordination	Resource Agency	Description
Maintenance and Protection of Traffic (MPT) Plans	NYCDOT	Approvals for use of sidewalks and street lanes during construction of the project.
Sidewalk Use Permits	NYCDOT	Agreement necessary for coordination and assumption by MTA C&D of utilities relocation, and for street work.
Tree Work / Construction Permits	New York City Department of Parks and Recreation ("NYCDPR")	Permits for construction activities within 50-feet of a street tree and construction impacts to street trees.
Water Discharge (Construction)	New York City Department of Environmental Protection ("NYCDEP")	During construction, this permit would allow Contractor to discharge the water from his activities after appropriate treatment, including dewatering of excavation, wheel washing.
State Pollutant Discharge Elimination System (May be covered by Water Discharge Permit)	New York State Department of Environmental Conservation ("NYSDEC")	Protection and control of surface wastewater and stormwater discharges in accordance with the Clean Water Act
Water Discharge (Operation) modification	NYCDEP	During operation, this permit would allow MTA C&D to discharge sanitation water
Construction Protection Plan	NYSOPRHP	Section 106 of the National Historic Preservation Act of 1966.
Historic Resource Construction Protection Plan	NYCDOB	Protection of historic resources within 90 feet of construction activity.
Noise and Vibration Construction Management Plans	MTA C&D / NYCDOB	Studies and plan required to manage noise and vibration during construction activity.

Chapter 8: Agency and Public Involvement

Public Outreach activities, including meeting with Elected Officials, Community District 4 and local residents, specifically Penn South residents, began in Summer 2021. Outreach activities included meeting with the Community Board in December 2021. A separate Penn South Board meeting was held in December 2021, with a follow-up meeting in February 2022. A meeting with elected officials was conducted in December 2021, which was followed up with a site visit in April 2022. In addition, a meeting with the Penn South Board is scheduled for August 31, 2022.

Short shutdowns of electric service to Penn South are anticipated during the construction activities. This was and will be discussed during the Public Involvement activities. Appropriate notice will be given prior to the shutdowns. It should be noted that Penn South has private utilities that connect the north and south sides of the complex and are located approximately 30 feet east of the Project Site.

In addition to the meetings with the community, several activities were performed during the EDDA process to ensure that the involved parties (consultants and agencies) are fully familiar and in agreement with the intended goals, objectives, and methodologies for this effort. MTA C&D has coordinated with NYCDOT, and a series of design and construction field views were held on-site with NYCDOT to discuss the Proposed Project during preliminary design.

Consultation with LPC and NYSHPO to request their preliminary determination of the potential sensitivity of the proposed substation site will be initiated. A Phase IA Cultural Resources Documentary Study was prepared and will be submitted to both agencies for review.

ATTACHMENT A:

PROPOSED SUBSTATION: WEST 28TH STREET/8TH AVENUE LINE EDDA EMF/I LITERATURE REVIEW

February 25, 2022

Metropolitan Transit Authority Construction & Development
DSO - Environmental Services
2 Broadway
New York, NY 10004

Attention: Thomas Abdallah, P.E., LEED AP
Deputy Vice President and Chief Environmental Engineer

Re: Proposed Substation: West 28th Street/8th Avenue Line EDDA
EMF/I Literature Review
New York, New York
Contract No.: CM-1519; Work Order #16

Subject: Electromagnetic Fields (EMF) Literature Review

Mr. Abdallah:

At the request of Metropolitan Transportation Authority (MTA) Construction and Development (C&D), STV Incorporated (STV) provides the following literature review in connection with the Environmental Due Diligence Assessment (EDDA) to support the construction of the proposed substation facility located on West 28th Street, New York, New York 10001 (the "Site").

The EDDA prepared for this project included a section that described electromagnetic fields (EMF) during operation of the substation. Additional information related to EMF and public health was requested by MTA C&D and is provided in this document.

References evaluated for this document prepared by MTA entities, as well as NYCDEP, and Amtrak, are listed in a numbered bibliography found in Attachment A [Attachment A: 1-8], and it should be noted that MTA has conducted additional independent studies on EMF for substation projects for environmental reports that range from Environmental Due Diligence Assessments (EDDA) through Environmental Impact Statements (EIS).

Major health industry statements indicate that there are no known health effects from electromagnetic fields associated with substations. As a result, there are no regulatory requirements associated with EMF and the installation of substations. Two reports that support these statements are cited below and in Attachment A.

- WHO International conducted a study in 2003: *Magnetic Field Measurement & Simulation of a 230 kV Substation* (paper07habiballah.pdf (who.int)) [Attachment A: 9]

- The American Cancer Society fact sheet on Electromagnetic Fields and Cancer (Electromagnetic Fields and Cancer - National Cancer Institute) [Attachment A: 15]

This finding appears to be consistent in the overall literature review and is not only the entities listed above investigating EMF. Concern related to EMF exposure appears to be focused on human-made sources of electromagnetism and that the increased levels of exposure that may have adverse biological effects. Exposure to electric fields from EMF generating facilities like substations and transmission lines, however, typically do not present a human health risk since these fields are effectively shielded by materials such as

trees, walls, etc. Other concerns related to EMFs focus on exposure to magnetic fields (i.e., the invisible fields created by moving charges) from transmission lines, [Attachment A: 10]. Literature indicated that magnetic fields cannot be easily shielded, but can be reduced by self-cancellation, depending upon the configuration of the lines. The closer the phases (wires that carry the circuit current) are configured, the greater the effect of field cancelation, which reduces the distance from the circuit that the magnetic field would be detectable. The magnetic fields or "field strength" is expressed in milliGauss (mG). [Attachment A: 13]

Major health industry representatives (WHO) and transportation industry leaders like USDOT Federal Transit Administration (FTA), electric distributers like PEPCO/Exelon Corporation, and public utilities, like California PUC, indicate that EMF has no impact on public health [Attachment A: 12-14]. Below is an EMF section that was prepared for the **No. 7 Subway Extension- Hudson Yards Rezoning and Development Program FGEIS** by a MTA subconsultant. This is being provided as published below and provides an example of the results of studies on EMF and the perceived impacts to public health [Attachment A: 1].

This project is located near the proposed West 28th Street substation location. The subconsultant prepared this report relying on data from Con Edison (ConEd) substations, data provided by the Illinois Institute of Technology Research (IITRI), and studies by Enertech Consultants for the Electric Power Research Institute (EPRI) [Attachment A: 1]. The subconsultant also obtained measurements on site and in the surrounding neighborhood to support the findings. As noted above, the excerpt below is a direct copy of this section in the report and does not reflect studies conducted by STV, nor does it reflect STVs opinions.

Health Effects- Excerpt from No. 7 Line Report

Over the past two decades there has been significant research investigating the potential for exposure to EMF to adversely affect human health. Health concerns have included a variety of diseases and other health endpoints such as reproductive outcomes. Concerns about the possible effect of EMF on human health originally focused on electric fields, but much of the recent research has focused primarily on magnetic fields.

To date, there is no sound medical or scientific basis to conclude that EMF causes cancer or any other disease. Neither the medical nor scientific communities have been able to provide any numerical exposure value or foundation upon which Federal or State regulatory bodies could establish a standard or limit for public exposure that is known to be either safe or harmful. There are no Federal or State standards related to the public health effects from electric and magnetic fields to serve as a basis for determining a level of impact. However, the New York State Public Service Commission established an engineering-based magnetic field standard of 200 mG applicable at the edges of new transmission line rights-of-way. The standard was designed to ensure that magnetic field levels around new transmission lines do not exceed magnetic field levels around existing transmission lines.

Although there is no sound medical or scientific basis to conclude that EMF causes cancer or any other disease, Con Edison designs and constructs substations to reduce potential magnetic field impacts in adjacent areas through careful positioning of equipment and use of shielding, as deemed appropriate. By designing substations in this manner, Con Edison has succeeded in limiting magnetic fields from the substations in adjacent areas to levels that are significantly below the PSC standard. Therefore, it can be concluded that the substation(s) associated with the Proposed Action are not expected to have any significant adverse EMF impacts.

All studies indicate that use of electric power is ubiquitous and the use of electric power creates power EMF. It is impossible to avoid exposure to EMF, as it is emitted by everyday electrical instruments (e.g.,

hair dryers, small appliance transformers) and such exposure can easily range into the hundreds or even thousands of milliGauss. In New York, as with any urban area in a developed country, walking down or across streets will produce periodic exposure into the hundreds of milliGauss from overhead distribution and buried electrical circuits and building transformers and network vaults [Attachment A: 10].

Studies also indicate, as described in the *Project Site for the New Power Substation at New Dorp, Staten Island,* that while there remains concern about the safety of exposure to power frequency magnetic fields, the scientific evidence for potential harm has not been sufficient to warrant regulation and in consequence, there are no established health and safety standards in the United States for these fields. A guidance value is provided by the American Congress of Governmental and Industrial Hygienists (ACGIH) who, in the most restrictive interpretation, sets 5,000 mG as their Threshold Limit Value (TLV). Internationally, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a recommendation for general public exposure of 833 mG. For context, it is certainly possible to encounter, albeit very briefly, fields in a developed society which might approach the U.S. standard (5,000 mG), but it is extremely unlikely. Typical values in a commercial office building range from 2-5 mG and in certain locations into the hundreds of milliGauss. Even the main switchgear room in a very large office building (60 stories) would not likely have a reading of 1,000 mG, anywhere in the room [Attachment A: 10].

As detailed in the *EMF Design Guidelines for Electrical Facilities* (2006), EMF reduction techniques are available. STV expects that MTA C&D will coordinate with ConEd during design and construction for the safe installation of the proposed West 28th Street substation. However, at this time, STV has not performed any detailed studies for the proposed West 28th Street substation and does not have any information regarding the specific substation design details, such as shielding methods. As such, STV is providing this literature review only and withholds providing any expert opinion on the proposed West 28th Street substation project related to the EMF studies.

Sincerely,
STV Incorporated

Dorothy Daly

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Cc: Luminita Marinescu, MTA C&D
Patrick O'Mara, STV
Robert Fields, STV

Enclosures:

Attachment A – Bibliography of Literature Review

BIBLIOGRAPHY OF LITERATURE REVIEW

Environmental Reports

1. Final Generic Environmental Impact Statement, Report: City of New York City Planning Commission (CPC) and the Metropolitan Transportation Authority (MTA) No. 7 Subway Extension—Hudson Yards Rezoning and Development Program, Chapter 18: Energy, 2004.
2. Final Environmental Impact Statement, Report: Long Island Rail Road (LIRR) Expansion Project, Chapter 16: Electromagnetic Fields, April 2017.
3. Final Environmental Impact Report, Report: Santa Clara Valley Transportation Authority Santa Clara-Alum Rock Transit Improvement Project, Chapter 3.7: Electromagnetic Fields, 2008.
4. Final Supplemental Environmental Impact Statement, Report: New York City Department of Environmental Protection (NYCDEP) Croton Water Treatment Plant Project, Chapter 4-17: Electric and Magnetic Fields (EMF) and Extremely Low Frequency Fields (ELF) Analysis.
5. Final Supplemental Environmental Impact Statement, Report: New York City Department of Environmental Protection (NYCDEP) Croton Water Treatment Plant Project, Chapter 5-17: Electric and Magnetic Fields (EMF) and Extremely Low Frequency Fields (ELF) Analysis.
6. Final Environmental Impact Statement, Report: New York City Department of Environmental Protection (NYCDEP) Catskill/Delaware UV Facility, Chapter 3.17: Electric and Magnetic Fields (EMF) and Extremely Low Frequency Fields (ELF) Analysis.
7. Supplemental Draft Environmental Impact Statement, Report: Metropolitan Transportation Authority (MTA)-New York City Transit Second Avenue Subway, Chapter 13: Infrastructure and Energy, 2004.
8. Draft Environmental Impact Statement, Report: Northeast Corridor (NEC) Future Tier 1, Section 7.17-Electromagnetic Fields and Electromagnetic Interference Assessment.

Studies

9. Habiballah IO, Dawoud MM, Al-Balawi K, Farag AS. Magnetic Field Measurement & Simulation of A 230 kV Substation.
10. New Dorp Proposed Substation Site - Electromagnetic Fields (EMF)
11. New York City MTA/Staten Island Rapid Transit Operating Authority. Proposed New Power Substation, Prince's Bay, Staten Island, New York, EMF Study excerpt

National Guidance

12. USDOT FTA Guidance on the Prevention and Mitigation of Environmental, Health and Safety Impacts of Electromagnetic Fields and Radiation for Electric Transit Systems; Prepared by U.S. Department of Transportation Research and Innovative Technology Administration John A. Volpe National Transportation Systems Center for the U.S. Department of Transportation Federal Transit Administration Office of Planning and Environment
13. EMF Design Guidelines for Electrical Facilities (July 21, 2006), California Public Utilities Commission
14. Electric and Magnetic Fields, Pepco-An Exelon Company (April 2018), prepared by Exponent, Inc.
15. National Cancer Institute at the National Institute of Health. Electromagnetic Fields and Cancer.

APPENDIX A:

PHASE I CULTURAL RESOURCE STUDY

APPENDIX B:

PHASE I ENVIRONMENTAL SITE ASSESSMENT OF PROPOSED SUBSTATION: WEST 28TH STREET/8TH AVENUE LINE

APPENDIX C:

TRANSPORTATION ANALYSIS